WORLD OIL

Established 1916 as THE OIL WEEKLY

Specialized Oil Publications of
THE GULF PUBLISHING COMPANY
P. O. Box 2608, Houston (1), Texas

WORLD OIL and The COMPOSITE CATALOG
for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG
for the refining-natural gasoline industry

RAY L. DUDLEY, *President, Publisher*
A. L. BURNS, *General Manager*

EDITORIAL STAFF
WARREN L. BAKER, *Editor*
L. J. LOGAN, *Associate Editor*
ELTON STERRETT, *Engineering Editor*

DISTRICT EDITORS

HENRY OZANNE
250 Park Ave.
New York 17, N. Y.

ANTHONY GIBBON
WILLIAM P. STERNE
Hunt Bldg.
Tulsa 3, Okla.

R. W. BYRAM
Drawer M
Capitol Station
Austin 21, Texas

E. N. TIRATSOO
62 Redcliffe Square,
SW 10
London

BERTRAM F. LINZ
Albee Bldg.
Washington 5, D. C.

GILBERT M. WILSON
W. W. Wilson Bldg.
Huntington Park, Calif.

H. H. KING
W. T. Waggoner Bldg.
Fort Worth 2, Texas

GEORGE O. IVES
AL REESE
J. E. KASTROP
CECIL SMITH
MARY E. POOLE
3301 Buffalo Drive
Houston 6, Texas

ADVERTISING STAFF
TOM W. NELSON, *Advertising Manager*
RANDALL BROOKS, *Assistant Advertising Manager*

NELSON BIGELOW
FRANK VICKREY
250 Park Ave.
New York 17, N. Y.

H. G. FITZPATRICK
332 S. Michigan Ave.
Chicago 4, Ill.

J. W. CURTS
W. W. Wilson Bldg.
Huntington Park, Calif.

ROGER MOTHERAL
1010 Euclid Ave.
Cleveland 15, Ohio

BILL ATCHESON
Hunt Bldg.
Tulsa 3, Okla.

CHARLES WYATT
3301 Buffalo Drive
Houston 6, Texas

CIRCULATION DEPARTMENT
CLINTON S. QUIN, JR., *Manager*

Published every Monday. Single copies 25 cents (except special issues). Subscription price: domestic and foreign, $2 a year; 2 years, $3; 3 years, $4. Advertising rates on application.

Copyright 1947 by The Gulf Publishing Company.

Contents

AUGUST 11, 1947

VOLUME 126, No. 11

Technical and Feature Articles

KANSAS NEBRASKA NATURAL GAS COMPANY'S PIPE LINE SYSTEM 31
(27th of a Series)

CONDENSATE PRODUCTION AND CYCLING 32
(First of a Series)
By Park J. Jones

OIL PRODUCTION FROM LONG CORES BY AIR-GAS DRIVE 36
By R. J. Day

RADIOGRAPHIC METHOD OF GEOPHYSICAL EXPLORATION 43
By M. S. Blackburn

DRILLING HINTS 54

News and Departments

LOOKING AHEAD 4
THE OUTLOOK 23
THE CHANGING PANORAMA 25
THE WEEK'S NEWS 27
INTERNATIONAL NEWS 29
CRUDE PRODUCTION 30
PIPE LINE NEWS 30
NEW EQUIPMENT, LITERATURE 49
MARKET TRENDS 58
FIELD OPERATIONS 59
EXPLORATORY FAILURES 74
MEN IN THE INDUSTRY NEWS 75
MANUFACTURERS' NOTES 77
BOOK REVIEW 78
SQUEAKS FROM THE BULL WHEEL 79
ADVERTISERS' INDEX 80

Precisionbilt FOR DEPENDABILITY

J&L WIRE LINES

PERMASET PRE-FORMED

Drilling crews find they can depend upon J&L Precisionbilt Wire Lines to give them safe, efficient drilling service. Those extra ton-miles they get will be favorably reflected in your drilling costs. Specify J&L Wire Lines for your entire drilling program.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

THE CHANGING Panorama

Two Years of Peace Not Smooth Sailing

AT THE middle of August, 1947, we stand two years removed from V-J Day, and many conditions after two years of peace are not as expected. There is disappointment and dissatisfaction with the progress made toward normal peacetime conditions. Shortages are lasting too long, and peacetime production compares unfavorably with the amazing record of wartime production. Already-excessive prices now threaten to go even higher and precipitate a serious business recession.

Impediments to production of needed goods have been numerous and complex. First there was the psychological letdown, when people wanted release from wartime tension more than they wanted to work. In that period strikes flourished, and inflation got off to a good start with the breakdown of wage control. The wage increases brought a slowdown of production as long as prices were held down and ultimately a breakdown of price control nearly a year ago. Subsequently, the economy has been more or less free to function in the normal way.

Prices have climbed very high since decontrol and have drawn forth very large production. Slowly but surely, supplies are geting in better balance with demand. Prices in the aggregate hit a peak in March, 1947, and though they subsequently have remained on a lofty plateau, it has been generally assumed until quite recently that a decline of perhaps considerable sharpness was inevitable.

Now a potential new round of wage and price increases clouds the situation. The recent coal miners' wage increase has brought increases in prices of coal. Higher coal prices have forced increases in prices of raw steel. Higher steel prices have led to increases in prices of manufactured steel products, including automobiles and oil industry pipe, casing, and tubing. Higher coal prices have thrown extra demand for fuel oil upon the petroleum industry, and prices of fuel oils are being forced upward by the resultant more urgent demand for already scarce oils, coupled with higher costs of oil industry steel goods.

It is now clear that the recent coal miners' wage increase was a far-reaching influence toward extra inflation, just when it had appeared that prices could be held in line or started back down toward sounder levels. The coal miners' gain, if any, now turns out to be other workers' and consumers' loss in purchasing power—power to purchase the many things raised in price in compensation for the higher coal mining wages.

In the petroleum industry there was in recent weeks—before the current new spiral—a real effort in some quarters to hold the line on prices of oils. The largest of all oil companies assumed leadership in the move and gained some following. But the pressure on oil prices is great, and there have been breaks to higher levels in numerous instances, affecting both crude oil and refined products. The new wave of price increases in other industries, including some from which oil companies buy, may be the last straw, determining that oil prices will go higher.

In the case of oil prices, the trends and the causes thereof are not materially different from those found in other industries. Because of the war, there are shortages and accumulated needs, and supply falls short of demand, with the result that prices are bid upward, as incentive for more supply. The principal difference between the situations of the oil industry and some other industries is that the petroleum industry has come nearer than most to fulfilling demand and avoiding scarcity. This favorable performance has been possible because the industry is geared fundamentally to either peace or war. It experienced no abrupt or seriously dislocating changes when war started or when war ended. It supplied oils in large and growing volumes before the war, during the war, and after the war, present operations being the highest ever recorded.

However, the industry normally expands facilities proportionally as demand increases, but was unable to do so during the war. Consequently, it now has considerable difficulty in meeting the present tremendous demand, pending urgently needed expansion of facilities. Insofar as oils are thus difficult to supply in volumes desired, the prices of oils are bid upward just as are the prices of other things not in plentiful supply.

However, there is a lesson in the above described vicious cycle of wage and price increases in numerous lines following the recent changes in the coal industry. All industry is inter-related, and an inflationary force in any major industry affects the whole economy. Insofar as the oil industry henceforth can hold the line on prices, it will make a real contribution toward arresting inflation and establishing a stable and dependable economy.

☆

The automobile industry, electrical equipment manufacturers, the Western Union Company, etc., have lost money. The railroads, merchant marine shipping and the construction industry just about broke even. Other businesses made money, some a lot of it. But we now have a new idea. It is the pooling of income, industry wide or nation wide. The Nathan report lumps all business in one pile, as in Russia. It forces companies which lost money to increase their wages and costs, and price their goods out of the market. It is an invitation to depression.

—SAMUEL B. PETTENGILL

Ten percent of the nation's productive activity is associated directly with the producing, processing and distributing of petroleum and its products. This is the measured judgment of R. B. Johnson, a federal reserve economist on the staff at the Dallas bank.

Liquid fuel and lubricating oils have become an indispensable part of industrial operations, he points out. Dependence upon the petroleum industry is increasing rather than decreasing.

—BUSINESS PRESS BUREAU.

"Users' Choice" of Piping Equipment ...in the Complete CRANE Line

Whatever you need in piping . . . valves, fittings, pipe, shop-fabricated units, or pipe line accessories . . . most likely Crane supplies it. Keep that in mind for a fast start and a good finish on every installation . . . new or replacement. And for good dependable quality always.

There's a Crane Branch or Wholesaler nearby to give you quick, modern service. One order covers everything you need. From start to finish, every piping job is simplified when you standardize on Crane equipment, because you get this 3-way advantage:

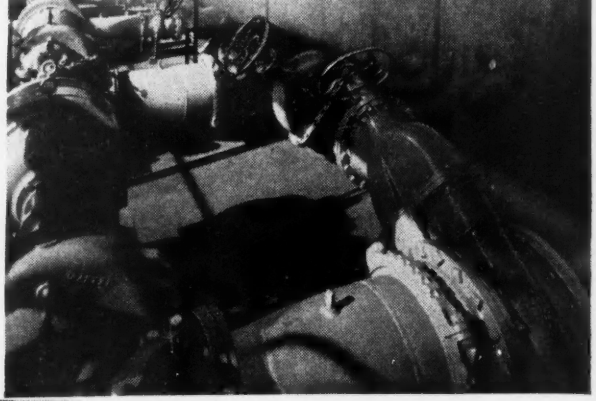
ONE SOURCE OF SUPPLY offering the world's largest selection of steel, iron, brass, and alloy piping materials for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials—helping you to get the best installation, and to avoid needless delays on the job.

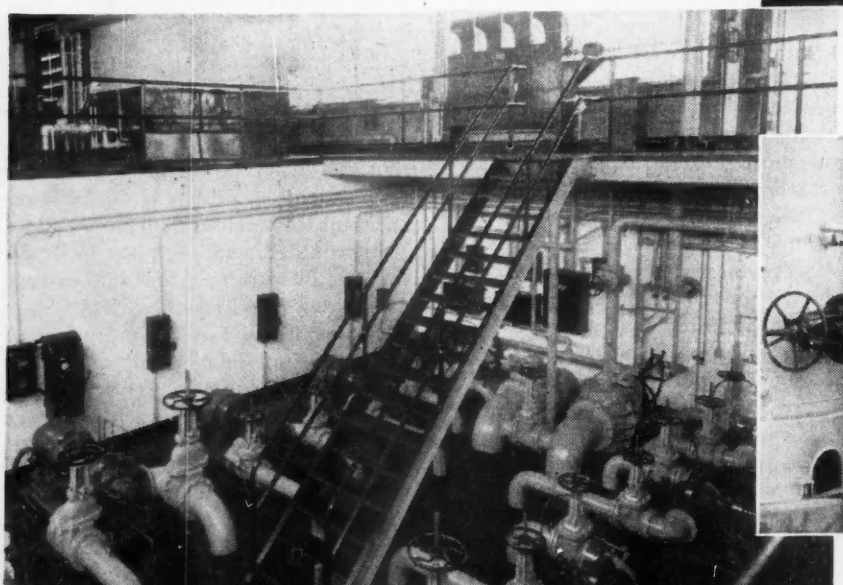
OUTSTANDING QUALITY in every item—assuring uniform dependability and durability throughout piping systems.

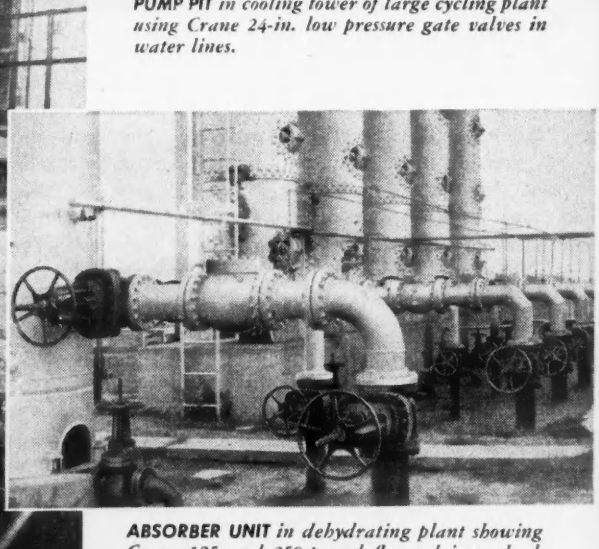
CRANE CO., 836 So. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Oil Country Areas

ONE
SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



PUMP PIT *in cooling tower of large cycling plant using Crane 24-in. low pressure gate valves in water lines.*





ABSORBER UNIT *in dehydrating plant showing Crane 125 and 250-pound flanged iron check and gate valves, and welding materials in 8 and 12-in. lines.*

GAS COMPRESSOR STATION *cooling water pumps equipped with Crane wedge disc and double disc gate valves. Also flanged and welding fittings from the complete Crane line.*

EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

THE WEEK'S NEWS

August Daily Allowable Hiked 20,841 Barrels by Texas Rail Commission

The August daily allowable for Texas was increased last week by the Texas Railroad Commission by 20,841 barrels, bringing the total calendar-day figure to 2,498,834 barrels. This was accomplished by reducing the number of shutdown days to a point where all fields in the state, with a few isolated exceptions, are permitted to produce at maximum efficient rates.

A statement issued with the order by Commissioner W. J. Murray, Jr., indicates that although a complete reworking of the proration schedule will be necessary to raise these isolated fields to their MERS, it will be accomplished. After that, he said, the only way a further increase in production can be had would be for a deliberate assignment to individual fields of allowables in excess of MER by the amount of the normal percentage of under production.

"The commission is taking this subject under advisement at the present time and will probably hear considerable discussion on it at its statewide oil and gas hearing in Austin August 20," the statement said.

Under the new order the Ownby and Sand Hill (Ordovician) fields may produce 26 days in August. Placedo, Refugio New, Fig Ridge, Livingston - Sparta, Tomball, Agua Dulce, Hawkins, Block 31 (Ellenburger), and Crossett are permitted 28 days. North La Ward, Colorado, and Flour Bluff were given 29 days. Quitman is permitted 30. Exempt altogether are Charlotte, South Cabeza Creek, Falls City, Greta Deep, Hondo Creek, Mauritz West, Mayo, Stewart, Alta Loma, Clear Lake, Danbury Dome, Dyersdale, Esperson Dome South, Hutchins, League City, Midfields, Needville, South Hyatt, Spurger, Village Mills, Alta Mesa, Borregas, Conoco-Driscoll, Kelsey Deep (Zone 17), Kelsey Deep (Zone 18), Kelsey Deep (Zone 19), Kelsey Deep (Zone 20A), Kelsey Deep (Zone 20B), La Gloria-Arguellez Zone, La Gloria-Corcoran Zone, La Gloria-Scott Zone, Midway, Minnie Bock North (Zone 13), Odem, Piedras Pintas-Segment, Plymouth, Rincon, Rooke, Seeligson (Zone 19-A), Seeligson (Zone 21-E), Seeligson (Zone 21-L), Seeligson (Zone 22), Shield, Taft, Well, White Point East, Chapel Hill, Pittsburgh, Winnsboro, Silver Valley, Williams, Eskota, North Avoca, West Avoca, Griffin, Central Noodle, South Noodle, Strand, Ivy, Olson, Tankersley, Landon, Levelland, Martin-Ellenburger, Robertson, Smyer, Three Bar, TXL-Upper Clear Fork, White and Baker, Hull-Silk-Sikes, New York City-Mississippi Lime, Dangle, Wilson-4000-foot Sand, Matlock, Steed, Illinois Bend, Mueller-Caddo, Rogers and Rogers, Sanders, Odell, Rock Crossing-Ellenburger, Irish and Ross Ranch.

Standard's Oil Price Stand Scored by Counsel for IPAA

A statement from Standard Oil Company (N. J.) that further oil price increases are unnecessary and would be inflationary drew the fire last week of some independent operators, who charged the statement gave the public the impression that Standard spoke for the entire industry.

In a report on the situation, Russell B. Brown, general counsel of TPAA, pointed out that while the New Jersey company was opposing further price increases, other companies, including some Standard subsidiaries, had announced increases. To some extent, he indicated, these increases will protect the industry's present customers against a deficiency in supply caused by a too great conversion from coal to oil because price favored use of the latter.

There are three elements in the problem of obtaining oil supplies—materials, manpower and money, Brown pointed out. "It frequently happens that there is a lack of one of these elements and sometimes of two," he commented. "Does that warrant the discarding of the third?"

"Standard is saying in effect that price is a factor that we can now disregard as there isn't enough steel anyway," he continued. "That is a sweeping assertion that fails to account for the possibility that price may have much to do with stimulation of supplies and that an adequate price certainly can be counted on to maintain efficiency in producing operations now under way."

Brown challenged any inferences that present crude prices are adequate, declaring there is sufficient data at hand to show they are not yet high enough, and supported a suggestion by B. A. Hardey, president of the IPAA, that the cost study made by the Crude Oil Industry Advisory Committee under the auspices of the OPA be brought up to date to provide a basis for any discussion of price which may develop.

Military Supply Situation Shows Some Improvement

A slow but steady improvement in the military supply situation is indicated by recent offerings of aviation gasoline received by the Army-Navy Petroleum Board, although increases in requirements from time to time are making it difficult for the industry.

National Petroleum Council and Oil and Gas Division representatives are in almost daily touch with the board, but the problem is one of conversion, complicated by the difficulties which beset the industry as a whole in the fields of transportation and materials.

Outcome of Record Test To Be Known Soon

The Superior Oil Company of California expects to know within two weeks the outcome of its record deep test, Weller 51-11, NW NW NE 11-8n-12w, in Caddo County, Oklahoma.

Edwin L. Smith of the Company's Oklahoma City office declared that crews were testing in upper horizons and expect to be through within two weeks.

The well is bottomed at 17,823 feet. No geological information has been released.

Brazil, Mexico to Admit U. S. Oil Firms, Washington Hears

Reports reaching Washington last week indicated that American companies will be given development opportunities in Mexico and Brazil, from which they heretofore have been barred.

From Mexico is was reported that arrangements were being perfected under which an American company, said in some circles to be Cities Service Oil Company, would drill 100 wells, but it was not stated what form the deal would take.

It was understood in Washington that if Cities Service goes into the country it will be under a contract with Pemex to drill wells, taking its pay in oil from and new deposits discovered. Also, it was reported, if no oil is found, Pemex will pay off in oil from its presently producing properties.

At the weekend, it was reported also that diplomatic negotiations were under way in Brazil for the granting of concessions to American companies in return for a loan from the U. S., said to be in the sum of $150 million.

The deal is said to have been arranged during the recent visit to Brazil of Secretary of the Treasury John Snyder. Revision of the Brazilian oil laws would be required, and this has been under consideration for some time, with Herbert Hoover, Jr., acting as special petroleum adviser to the Brazilian government. A new law is understood to have been tentatively drafted, but there still are a number of problems to be settled.

Individual Licenses for Exports of Oil Pipe Required After October 1

Individual licenses will be required for all exports of oil pipe, effective October 1, under new regulations promulgated by the Office of International Trade.

Pipe and other controlled iron and steel products now may be shipped abroad under consolidated licenses. Under the consolidated license system, exporters may ship licensed quantities of steel products to any country, except the occupied countries and certain other areas, but under individual license, and the exporter will be required to apply separately for each item to be shipped, showing the name of the consignee, the country, and the use to which the commodity is to be put.

The new order will become effective at the beginning of the next quarter, and the export quotas of iron and steel products for that period will be announced in the near future.

National Science Foundation Bill Vetoed as Unwieldy and Unworkable

Legislation creating a National Science Foundation, passed in the final days of the Congressional session, was vetoed by President Truman last week as unwieldy and unworkable.

Expressing his regret over the necessity for such action, the President explained that he had urged the establishment of a foundation to correlate Federal and private research and complained that the bill Congress sent him was a "marked departure from sound principles of administration" and would impede rather than promote the government's efforts to encourage scientific research.

The legislation provided that the foundation should be composed of 24 members, all established authorities in the various fields of science, who would be authorized to establish a national policy for the promotion of basic research and develop a research program to promote the national defense and welfare.

The President said that one reason for his veto was this vesting of vital national policy determinations and the expenditure of large public funds in the hands of a group "of individuals who would be essentially private citizens," whom the President could not effectively hold responsible for proper administration. The whole organization, he said, would be unduly complex and unwieldy.

Truman expressed the hope that Congress would reconsider the matter next session and develop legislation free from the vital defects which he had pointed out.

Rocky Mountain Oil Resources To Be Topic at Compact Meet

Petroleum resources of the Rocky Mountain states and their pospects for future development will be included in discussions at the Interstate Oil Compact Commission's three-day quarterly meeting in Great Falls, Mont., August 11-13, Chairman Hiram M. Dow announced.

Montana's oil and gas potentialities will be analyzed by Gov. Sam C. Ford to open the general session August 12.

Experimental work in obtaining petroleum products from the shale deposits in Colorado, Wyoming and Utah will be the subject of a paper by R. A. Cattell, chief of the petroleum and natural gas division of the U. S. Bureau of Mines, at the August 13 session.

Maximum efficient rates of production will be the major subject for the Regulatory Practices committee which has been seeking for some time to determine factors and standards that may be used by all states in establishment of such rates.

Mines Bureau Sees August Demand of 5,152,000 Barrels

Domestic crude production required to meet demand this month will average 5,152,000 barrels daily, an increase of 132,000 barrels over the July estimate, it was forecast last week by the Bureau of Mines.

At the same time, the bureau issued a preliminary estimate placing actual total demand for all oils during the second quarter at 515 million barrels, or approximately 1 percent above the amount forecast in June, and saw in present trends a total demand in the third quarter that may exceed previous forecasts by 1 to 2 percent.

A major factor in demand over the next few months may be advance stocking by distributors and consumers of fuel oil, the bureau said, and while increases in product prices and the signing of the new wage contract for the coal industry may result in some shift in demand from fuel oil to coal, it still will be necessary to maintain refinery operations at capacity levels until the various factors in supply and demand are clarified.

The bureau's forecast for August includes estimates of total gasoline demand of 78 million barrels, a yield of gasoline from crude oil of 42 percent, and total crude runs to stills of 5,130,000 barrels daily.

More Steel Shipped to Oil Industry in First Quarter

Finished steel shipments destined for the oil and natural gas industry during the early months of 1947 were one-third larger than during the final four months of 1946, it was reported last week by the American Iron and Steel Institute.

Overall shipments in the first four months of the year totaled 861,524 tons, an increase of 35 percent over the 638,625 tons shipped in the last four months of 1946, the Institute said.

"This improvement in steel shipments to this industry is attested to by the fact that the footage of wells drilled during the first four months of 1947 at 32,774,195 feet was at an annual rate of 98 million feet, close behind the 1937 record total of 101 million feet," it stated.

The Institute pointed out that no real comparison can be made between 1947 shipments and those of the corresponding period last year because of the major strikes prevailing during that interval.

Senate Group Plans Probe Of Charges Against Majors

A three-man Senate subcommittee will make an investigation of charges that large oil companies are diverting products to their own outlets with the result that independent dealers are being forced out of business.

The probe was ordered by Sen. Kenneth S. Wherry of Nebraska, chairman of the Senate Small Business Committee, who said that "hundreds" of station operators and dealers in the Midwest are being frozen out as a result of such practices.

Average Cost of Drilling Well Rises Again in 1946

The estimated cost of drilling wells in U. S. by 30 oil companies averaged $70,200 per well in 1946, a further slight increase over the $69,300 per well in 1945, and more than double the $32,500 per well in 1941. This estimate is made in the Chase National Bank's annual survey of the combined financial and operating activities of 30 oil companies for 1946 released August 11 in booklet form. The review was prepared by Dr. Joseph E. Pogue, vice president in charge of the bank's petroleum department, and Frederick G. Coqueron, staff associate. The estimate of the well drilling costs in 1946 is based on combined expenditures by the 30 companies of $530 million, of which $380 million or 71.7 percent went for intangible development costs.

The 30 companies are described in the report as representing about two thirds of the total investment in the American petroleum industry. Since they were shown to have a gross investment on December 31, 1946, of $11,902,521,000 in the U. S. and $1,310,887,000 in foreign countries for a total of $13,213,408,000, it is indicated that the domestic industry as a whole represents a gross investment of approximately $18 billion in property, plant and equipment.

The 30 companies' gross domestic investment of nearly $12 billion was distributed among the several departments as follows: 50.7 percent in production facilities, 13.1 percent in transportation, 21.4 percent in refining, 13.2 percent in marketing, and 1.6 percent in administrative and other properties.

Capital expenditures of the 30 companies in 1946 totaled $1,379,000,000, an increase of 23.6 percent over 1945 and 70.2 percent more than the outlay in 1941. The production department of the business accounted for 59.0 percent of the 1946 expenditures.

Charge of FPC Lobbying to Be Probed by House Committee

Charges by Representative Ross Rizley of Oklahoma that members of the Federal Power Commission had violated a federal statute in lobbying against the legislation amending the natural gas act will be investigated by the House Committee on Expenditures in Executive Departments.

A subcommittee headed by Rrepresentative Clare E. Hoffman of Michigan, chairman of the committee, and composed of Congressmen George H. Bender of Ohio, Forest A. Harness of Indiana, J. Caleb Boggs of Delaware, John J. Delaney of New York, Frank M. Karsten of Missouri and Henderson Lanham of Georgia will make the FPC inquiry the first matter on its summer schedule.

Information gathered by Rizley has been turned over to the subcommittee, which also has requested the power commission to submit material from its files. After study of this data, the subcommittee may go further into the matter in public hearings.

Lobau Refinery Seizure Gives Soviet Control of Entire Production System

Seizure of the Lobau refinery at Vienna, Austria, by the Russians last week accents sharply the ever-increasing deterioration of relations between the Soviets and the Western Allies wherever their interests conflict. Not only was the refinery seized in the middle of the night by truckloads of armed forces, but the pipe lines to the Zisterdorf oil fields were taken over, too. This now places operation of the entire system, from producing the disputed fields to final loading of products, in Russian hands.

The critical petroleum situation in Austria was discussed by Dr. J. Brian Eby after a visit to Vienna last fall in the November 4, 1946, issue of *The Oil Weekly* (now WORLD OIL). At that time, nearly 1½ years after the fighting in Europe has ceased, American and British oil investments in Austria were the subject of a long series of bitter and futile conferences with the Soviets. The most serious bone of contention is the return to the Western Allies all their Austrian oil properties confiscated by the Germans in July, 1940. The Western viewpoint is that these properties should properly be returned to their original owners. The Russians have refused to return the properties which account for about three-fifths of Austria's total annual production (approximately 5,600,000 barrels in 1946).

Vigorous protests have been lodged with the Soviets by the U. S. and British governments against this most recent seizure by Red troops. It came at a time when a reparations committee of the four powers was meeting in Vienna, and before the commission had had an opportunity to act on this particular property.

The diplomatic protest follows a demand by Lieutenant General Geoffrey Keyes, American member of the Four Power Control Commission for an explanation by Colonel General V. V. Kousarov, Russian member.

Keyes declared that the action could be understood if the Red forces had seized the property in the capacity of trustee pending agreement on definition of what constituted German assets for inclusion in the Austrian peace treaty.

"But," he added, "if the refinery has been seized as a German asset without awaiting completion of discussions or resolution of differences either within the Austrian treaty commission or the council of foreign ministers, the action cannot be understood or accepted."

The Lobau refinery, which has a crude throughput capacity of approximately 4000 barrels a day, is jointly owned by Socony-Vacuum Oil Company and Anglo-Saxon Petroleum, Ltd., (Shell Group). It was seized by the Germans in 1940 upon their entry into Austria, and formal claims for restitution have been filed by American and British owners for their return. The Soviets have interpreted the Potsdam Agreement as giving them possession of all German assets within their zone of occupation as war reparations, and have not relinquished control of interests which should properly be returned to former owners.

Canadian Subsidiary Set Up By Gulf Oil Corporation

Gulf Oil Corporation, which has been operating in Alberta since 1941 through its Gulf Research & Development Company, has set up a Canadian subsidiary, the Canadian Gulf Oil Company. All development, holdings and personnel in Alberta will come under name of the new company.

Reorganization of Italian Petroleum Industry Studied

Reorganization of the Italian petroleum industry, with market quotas for native and foreign firms and resumption of import licensing, is being studied by an Interministerial Petroleum Commission set up for the purpose, according to reports from Rome.

The Comitato Italiano de Petroli, set up after the close of hostilities and due to be terminated last April, is expected to be continued and transformed into an organization which will include all of the oil companies operating in Italy, which gradually will take over their activities and the administration of their facilities, still under the management of the CIP.

Another important matter, it was reported by James Parker Wilson, senior economy analyst in the embassy at Rome, revolved around the reconstruction of the petroleum properies. The CIP has provided for certain essential rebuilding and has utilized for this work a part of the earnings derived from the management of the Anglo-American properties which were sequestered by Italy during the war. The current program is designed to restore a major part of the war-damaged installations and will be finished within a few months if the present rate of progress is maintained.

The Ufficio Petroli plan to meet Italy's petroleum requirements during the current year calls for the importation of 1,300,000 metric tons (9,947,600 barrels) of crude, 1,393,000 tons of fuel oil, 240,000 tons of gasoil, 140,000 tons of bitumen and smaller quantities of coke, paraffin, kerosine and aviation and motor gasoline. Estimated consumption of products for the year is 2,711,300 tons, of which 1,059,380 tons will be produced domestically from imported crude. This will be about 500,000 tons more than the consumption estimated for the first year of the war.

Transjordan Development Pact Details Announced

The Office of International Trade has revealed complete details of the transaction under which exclusive petroleum and development rights in the Transjordan have been granted to Petroleum Development (Transjordan) Ltd., a subsidiary of Iraq Petroleum Company.

The agreement runs for a period of 75 years, with consideration being in the form of a combination of guaranteed annual payments and stipulated oil royalty payments. The annual payments being scaled upward during the first 15 years or until exports of production might reach the level of 1 million tons (about 7½ million barrels) yearly.

The initial 15-year period is divided into five-year periods. The company will make annual payments, in gold pounds, of $123,600 during each of the first three years, with payments to be increased for each of the four succeeding three-year periods to $206,000, $329,600, $494,400, and $659,200, respectively.

According to terms of the contract, if exports should reach 1 million tons yearly before the first 15 years have expired, payments are raised to $824,000 yearly. Payments then range upward according to the average gravity of exported oil. If the 1 million tons fall within the 20-25 gravity range, payment is $1,648,000; between 25 and 35 degrees, $2,472,000; above 35 degrees, $3,296,000.

Royalty per barrel would range from 15 cents for 20-gravity or less to 22 cents for above 35 gravity, total amount due from royalties each year to be deducted from annual payments, and the balance to become payable in the first quarter of the following year.

A lump sum contribution of $16,240 is also called for each year until the country reaches the point where it exports 1 million tons yearly, after which the lump sum will be $123,600 each year.

East Indies Installations Damaged Little in Fighting

Recent fighting in the Netherlands East Indies between the Dutch and Indonesians resulted in comparatively little damage to oil installations according to a survey made in Sumatra by civil authorities and representatives of American interests at Palembang.

Contrary to early reports that the Indonesians pursued a "scorched earth" policy in withdrawing from the southeastern Sumatra area, it was learned that while some oil wells in the Pendopo area had been burned, comparatively few wells had been fired, and all blazes were under control. No damage was suffered at Shell's Pladjoe refinery which had also escaped serious damage during World War II. This refinery is operating on oil brought in by tanker from Borneo, and is expected to be brought up to full prewar capacity of 62,280 barrels daily by the end of the Summer.

Standard-Vacuum Oil Company's refinery at Soengei Gerong near Palembang is also being rehabilitated and is expected to be turning out a full line of products before the end of October.

Tubular Goods Survey Discussed

A nation-wide survey of tubular goods in the hands of the industry is being discussed in National Petroleum Council circles as a means of developing whether there are any stocks in excess of actually anticipated requirements which the owners might be induced to sell to more needy operators.

A similar survey during the war disclosed some substantial stocks and made possible deals which diverted excess materials into immediately productive operations.

Currently, there is no definite information as to tubular goods actually in the hands of the industry, nor is there any knowledge whether there has been any speculative buying by outsiders aiming at an eventual "killing." Nothing could be learned about the latter by a survey, of course, but it is believed there may be some excess stocks in the hands of some operators, and also there may be some used material which could be put to work.

Some operators believe that if prices were "right," rather substantial quantities of materials might come to light.

Hearings on Michigan Line Applications Set by FPC

The Federal Power Commission will open hearings August 13 on the application of Michigan Consolidated Gas Company for construction of facilities for storage of gas in the Austin gas field in Michigan.

The hearings also will go into the application of the Austin Field Pipe Line Company for construction of 140 miles of 26-inch pipe line from the field to the Michigan Consolidated line in the Detroit district and a line connecting the Austin field with the Reed City field, to be operated by Michigan Consolidated pending completion of the Michigan-Wisconsin Pipe Line Company's proposed Texas-to-Michigan system, which eventually would take the facilities over.

Sunray Laying 93-Mile Line To Plant Bought from WAA

Sunray Oil Corporation is laying a 93-mile, 6-inch pipe line from its Allen refinery to the Duncan, Okla., Associated Refineries plant which the company apparently acquired from War Assets Administration on a bid of $5,100,000. The line will be used to provide charging stock for the Duncan plant and to carry gasoline back to Allen, where it will enter the Great Lakes Pipe Line Company system extending north into Minnesota.

Sunray reported it would spend nearly $2 million for modernization and additional facilities at the Duncan refinery. The company will install a 20,000-barrel crude oil topping plant to provide charging stock.

Basin System Adopted as Name Of 515-Mile Jal-Cushing Line

Basin Pipe Line System has been adopted as the operating name for the 515 miles of 20-to-24-inch crude carrier to be built by four companies from Jal, N. M., via Wink, Midland and Wichita Falls, Texas, to Cushing, Okla.

The joint project will be participated in by The Texas Pipe Line Company, Shell Pipe Line Corporation, Sinclair Refining Company, pipe line department, and Empire Pipe Line Company, with each having representation on a committee that will direct the construction and operation of the carrier. The starting capacity will be 144,000 barrels of crude daily from the Permian Basin, using mainline stations at Jal, Wink, Midland, and Wichita Falls.

Crude Oil Production in the United States

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED August 9	August 2
Alabama	1,200	1,150
Arkansas	75,500	75,500
California	920,000	921,500
Colorado	45,700	45,500
Florida	1,025	1,025
Illinois	177,300	179,400
Indiana	17,650	17,500
Kansas	283,100	292,750
Kentucky	26,100	26,200
Louisiana	427,150	423,255
North Louisiana	97,100	97,100
South Louisiana	330,050	326,125
Michigan	41,000	43,750
Mississippi	101,350	98,700
Missouri	100	100
Montana	23,200	23,300
Nebraska	500	550
New Mexico	108,550	108,600
New York	13,500	12,900
Ohio	9,000	8,800
Oklahoma	388,550	385,400
Pennsylvania	35,500	34,100
Tennessee	25	25
Texas	2,283,500	2,263,675
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	23,450	22,400
Dist. 2—Middle Gulf	157,900	144,700
Dist. 3—Upper Gulf	484,750	486,450
Dist. 4—Lower Gulf-S.W.	235,800	217,100
Dist. 5—East Central	39,500	39,250
Dist. 6—East Texas Field	324,000	324,000
Dist. 6—Rest of Northeast	113,800	113,000
Dist. 7-B—North Central	39,000	37,650
Dist. 7-C—West Central	39,350	39,250
Dist. 8—West	617,100	631,500
Dist. 9—North	125,800	124,500
Dist. 10—Panhandle	83,050	83,875
West Virginia	7,600	7,300
Wyoming	118,800	119,500
Virginia	200	200
Total United States	5,106,100	5,090,650

(Estimates compiled by WORLD OIL. All figures indicate daily averages in barrels.)

Air Patrol Unit Formed by Interstate Pipe Line Firm

Formation of an aviation unit was announced by the Interstate Oil Pipe Line Company. The patrol will cover the company's main trunk line systems and the lines of the Ajax Pipe Line Corporation.

The system will be instituted around September 1 when the personnel has completed an intensive course of training and orientation. The patrol will cover Interstate lines in Oklahoma, Arkansas, Louisiana and Mississippi, and the Ajax line from Glenn Pool, Okla., to Wood River, Ill.

Three planes will be required. Two will be based in Tulsa and the third will operate out of Baton Rouge, La.

The aviation unit, which also will operate the company's twin-engine executive transport, is headed by Chief Pilot F. T. Pipkin, and includes four pilots and an aircraft and engine mechanic.

Each of the planes will spend four days in the air on regular patrol work, an average of about 1500 miles per week.

Communication between pilot and ground personnel will be maintained by means of signal panels on the ground and messages dropped from the planes.

35-Mile Gas Line Being Laid In Louisiana by Anchor Firm

A 35-mile pipe line which will move about 10 million cubic feet of natural gas daily from wells in the Church Point, La., area of Eola, La., is being laid by the Anchor Gasoline Corporation of Tulsa. Cost is estimated at $325,000.

The company will remodel a present gasoline processing plant at Eola at a cost of about $125,000, and work should be completed within six months.

The line will carry the gas from oil wells in the Church Point district to the Eola processing plant. It will be used for gas lift purposes. After repressuring, the gas will be reprocessed and sold to the Southern Carbon Company of Monroe, La.

Highlander Building Nine-Mile Gathering System Extension

Highlander Gasoline Company, operator of a natural gasoline plant in the Rogers & Rogers field, Montague County sector of North Texas, is completing a nine-mile six-inch extension of its gas gathering system to purchase 1½ million cubic feet of residue gas daily from Continental Oil Company's recycling plant in the Hildreth field. This supplemental gas supply will be made available by Highlander to commercial and domestic gas consumers at Nocona.

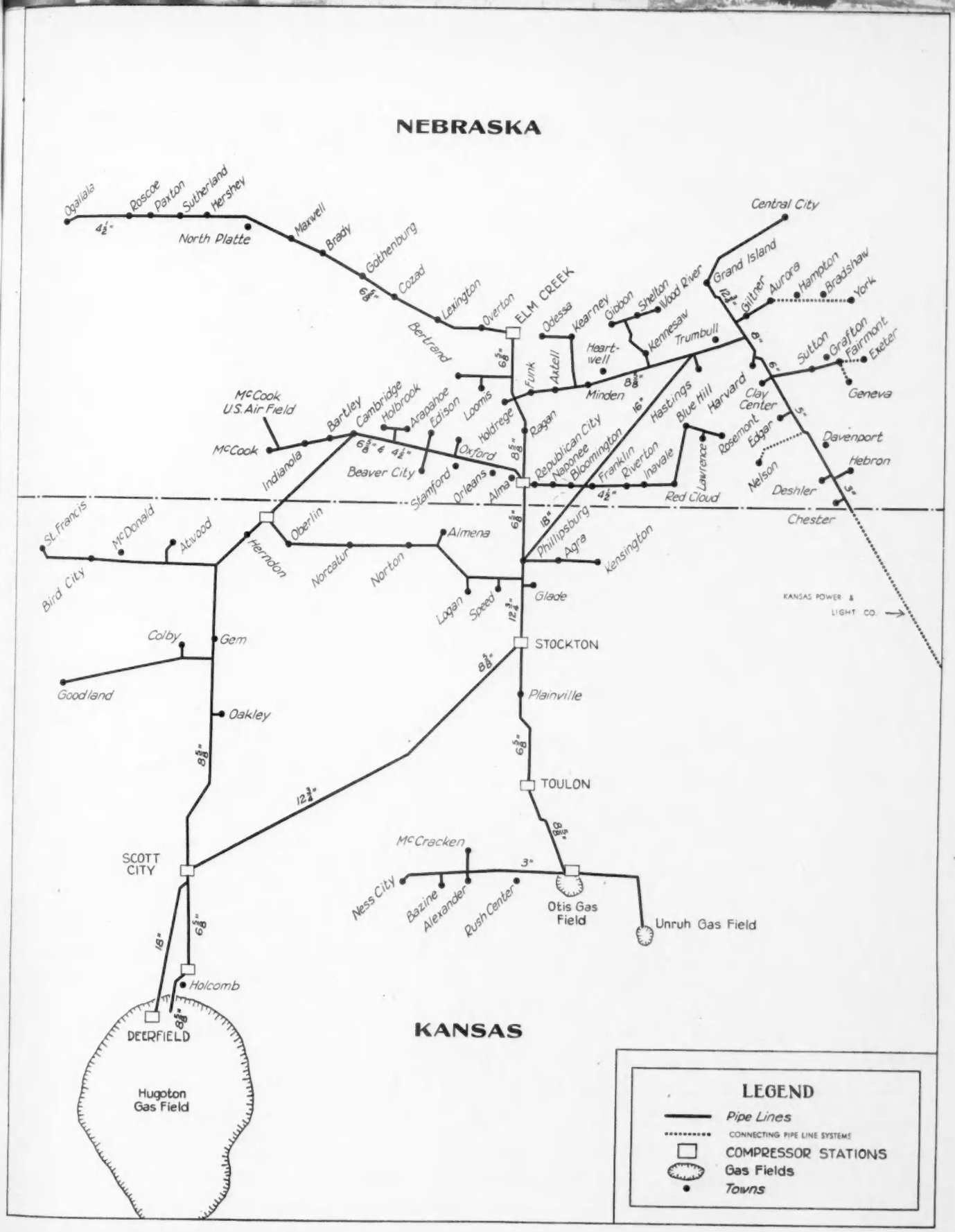
Lone Star to Build 20-Mile Extension for Gas System

Lone Star Gas Company has authorized the construction of a 20-mile 10-inch extension of its North Central Texas natural gas system from Breckenridge to the Kendall and adjacent areas in southwestern Young County.

Pipe Lines of the U. S.

Kansas Nebraska Natural Gas Company

27th of a Series



By PARK J. JONES
Consultant

Condensate PRODUCTION AND CYCLING

Part 1. Condensation in Reservoirs

HYDROCARBONS in place are called reservoir fluids. In place liquid phase is called reservoir liquid and a gas phase, reservoir gas. A reservoir gas is classified as dry, wet or retrograde. A reservoir gas out of which a liquid phase condenses upon reduction of pressure at reservoir temperatures is called retrograde gas.

A reservoir gas which is not a retrograde gas but from which a liquid can be extracted profitably is called a wet gas. There is no condensation of a liquid phase from a wet gas upon reduction of pressure at reservoir temperature.

Figure 1-1 is a phase diagram for a retrograde gas. The contours show volume percent liquid phase for a fixed composition but variable volume. The P_d, or zero volume percent liquid phase, curve gives the dew-point pressure. A decline in pressure below dew-point pressure is accompanied by condensation to a minimum condensation pressure. At 200° F., for instance, the volume percent liquid phase increases to about 2750 pounds per square inch absolute. The region between the dew-point and minimum condensation pressure is the retrograde gas region. The region on the left of minimum condensation pressure is the wet gas region. A retrograde gas becomes a wet gas when reservoir pressure declines below the minimum condensation pressure for a retrograde gas.

Reservoir liquids expand and vaporize a gas phase. In a retrograde region, the volumetric rate of vaporization is less than the volumetric rate of condensation and the volume percent liquid phase increases. In a wet gas region, the volume percent liquid phase decreases as pressure declines. But volume percent liquid phase also varies with the space occupied by two phases. Consequently, the minimum condensation pressure relative to a variable volume and a fixed composition is not the minimum condensation pressure in a reservoir.

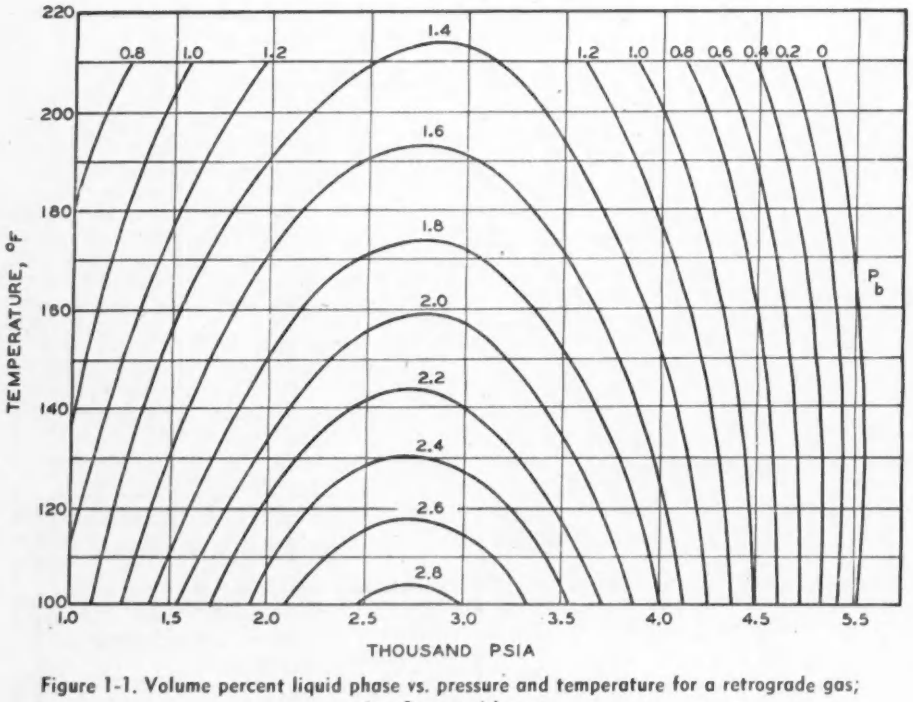


Figure 1-1. Volume percent liquid phase vs. pressure and temperature for a retrograde gas; after Sage and Lacey.

Liquid Equivalents

A component in a gas has an equivalent liquid volume. Let M be the molecular weight, and S the specific gravity relative to water, of a component. The equivalent barrels of liquid per million cubic feet of a component, BPMM, is defined by

$$BPMM = 7.543M/S \quad (1)$$

The equivalent gallons of liquid per Mcf of a component, gpm, is given by

$$Gpm = 0.3168M/S \quad (2)$$

The equivalent barrels of liquid per mole of a component is defined by

$$Barrels/Mole = 0.00286M/S \quad (3)$$

and gallons per mole, by

$$Gallons/Mole = 0.120M/S \quad (4)$$

Evidently, hydrocarbon production may be expressed in terms of gas volumes or liquid volumes. If the source of revenue is from a gas, volumes are expressed in cubic feet. But when the source of revenue is from a liquid, volumes are expressed in barrels. Both units of volume refer to standard conditions, SC. The latter are 14.73 psia for pressure and 60°F. for temperature.

Produced Hydrocarbons

The production from a well when processed in a plant gives residue gas and product. The barrels of product commonly extracted at current prices from a million cubic feet of production is volumetrically about equal to the barrels of butanes plus in production. For this reason, product is conveniently defined

RESERVOIR pressure decline below the dew-point pressure of a retrograde gas causes condensation of a liquid phase. Retrograde condensation is usually obtained in a laboratory by declining pressure on a fixed weight of hydrocarbons held at reservoir temperature. This is called equilibrium condensation, that is, constant weight and increasing volume; whereas, a declining reservoir pressure is accompanied by differential condensation, that is, variable weight and constant volume aside from water encroachment. A procedure based on field experience is given for estimating condensation in reservoirs in terms of equilibrium condensation data. Three retrograde gases ranging from 27.8 to 135.9 barrels of butanes plus per million feet of methane plus are included. The loss of butanes plus by condensation at declined reservoir pressure will be discussed in Part 2 of this series.

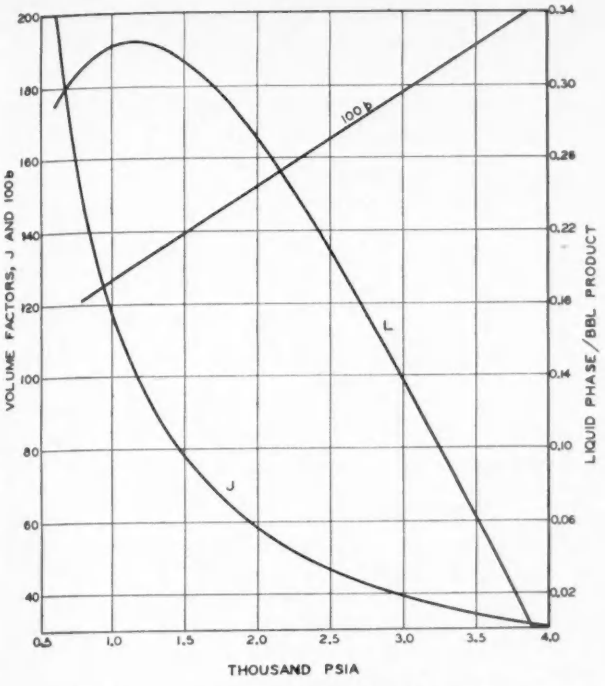


Figure 1-2. Volume factors J and b and liquid phase L vs pressure for reservoir gas A at 212° F.

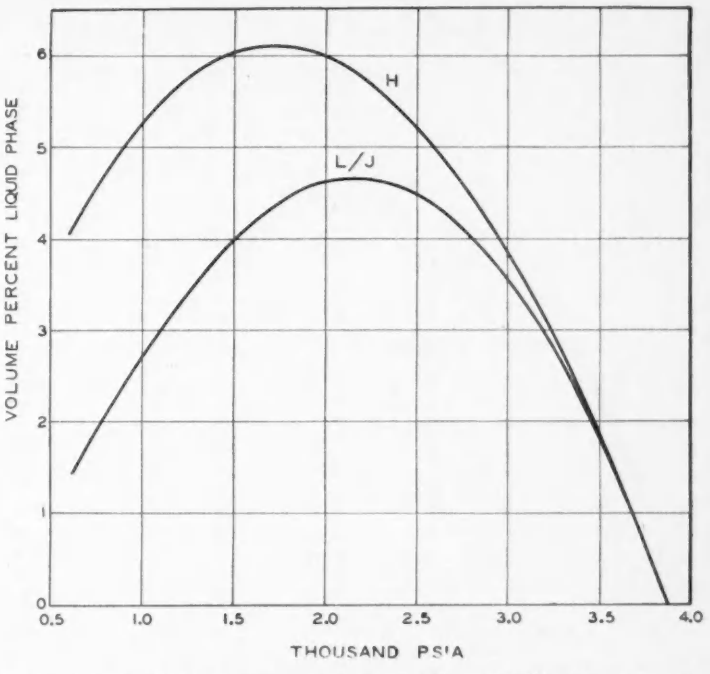


Figure 1-3. Equilibrium, L/J, and estimated differential, H, volume percent liquid phase for reservoir Gas A at 212° F.

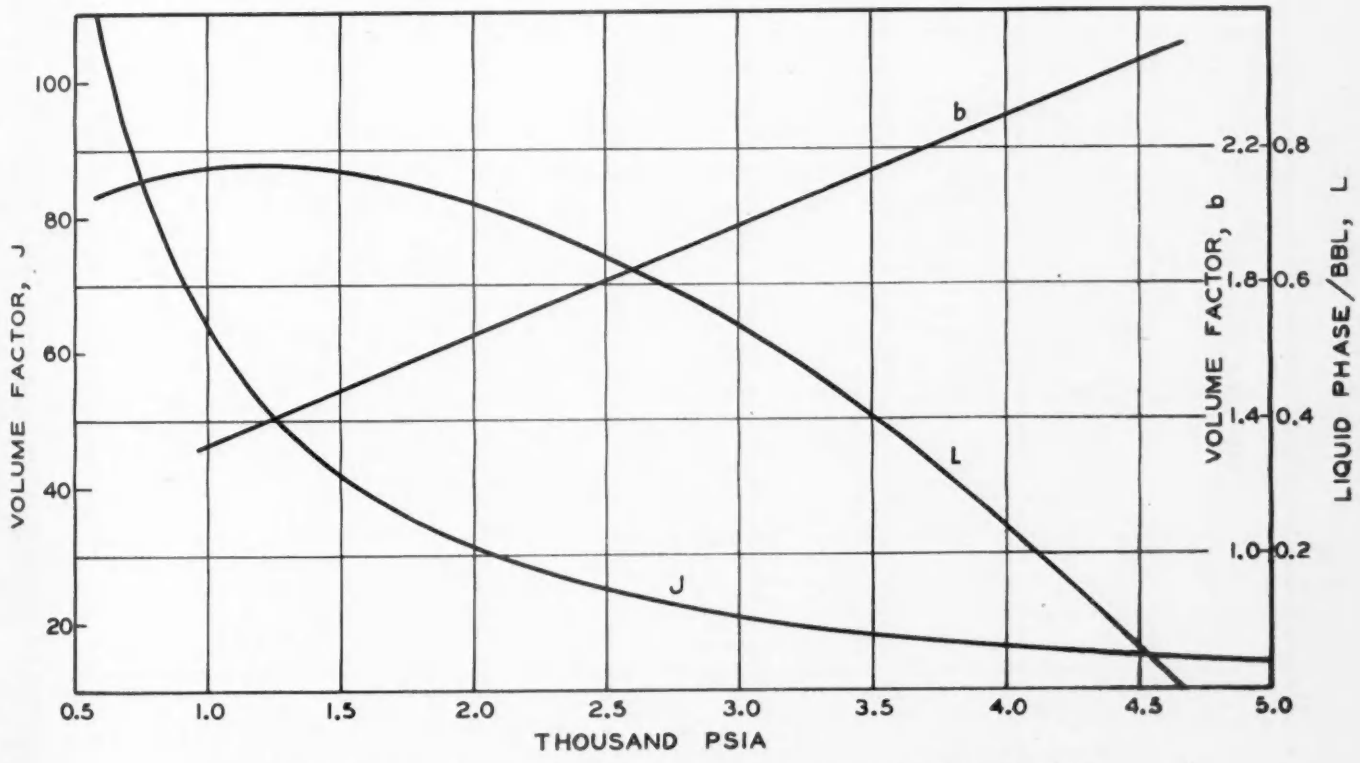


Figure 1-4. Volume factors J and b and liquid phaseL vs pressure for reservoir Gas B at 220° F.

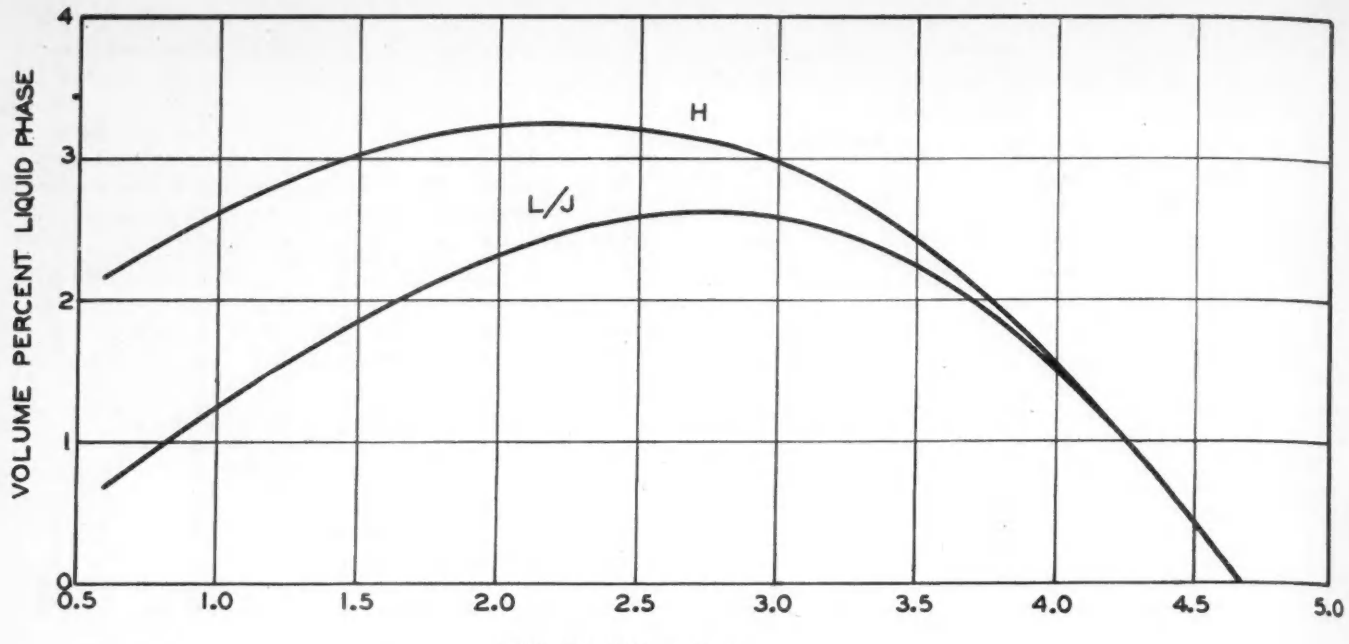


Figure 1-5. Equilibrium, L/J, and estimated differential, H, volume percent liquid phase for reservoir gas B at 220° F.

as butanes plus and residue gas, as propane and lighter.

Propane-free product and butane-free residue gas will be used as a standard for estimating condensation in reservoirs, gas-liquid ratios, volume factors, separator yield and so forth.

Reservoir Gas A

Table 1-1 gives some properties of a reservoir gas. Let A denote this gas. There are 27.8 barrels of product per million cubic feet. The residue gas product ratio is 35,150 cubic feet per barrel. One barrel of product occupies 31.07 barrels of reservoir space at dew-point pressure. At pressures less than 3870 psia, a liquid phase condenses out of the gas. The L curve in Figure 1-2 shows the barrels of liquid phase per barrel of product. The J curve is for the gas phase plus liquid phase, that is, J includes L.

The J and L data were determined in a laboratory for the composition given in Table 1-1. The b curve in Figure 1-1 is an estimated volume factor for the liquid phase. The J and b data are barrels of methane plus at 212° F. per barrel of butanes plus at SC. The composition of the liquid phase varies with pressure. Whereas the composition of the composite, gas and liquid phases combined, does not vary with pressure.

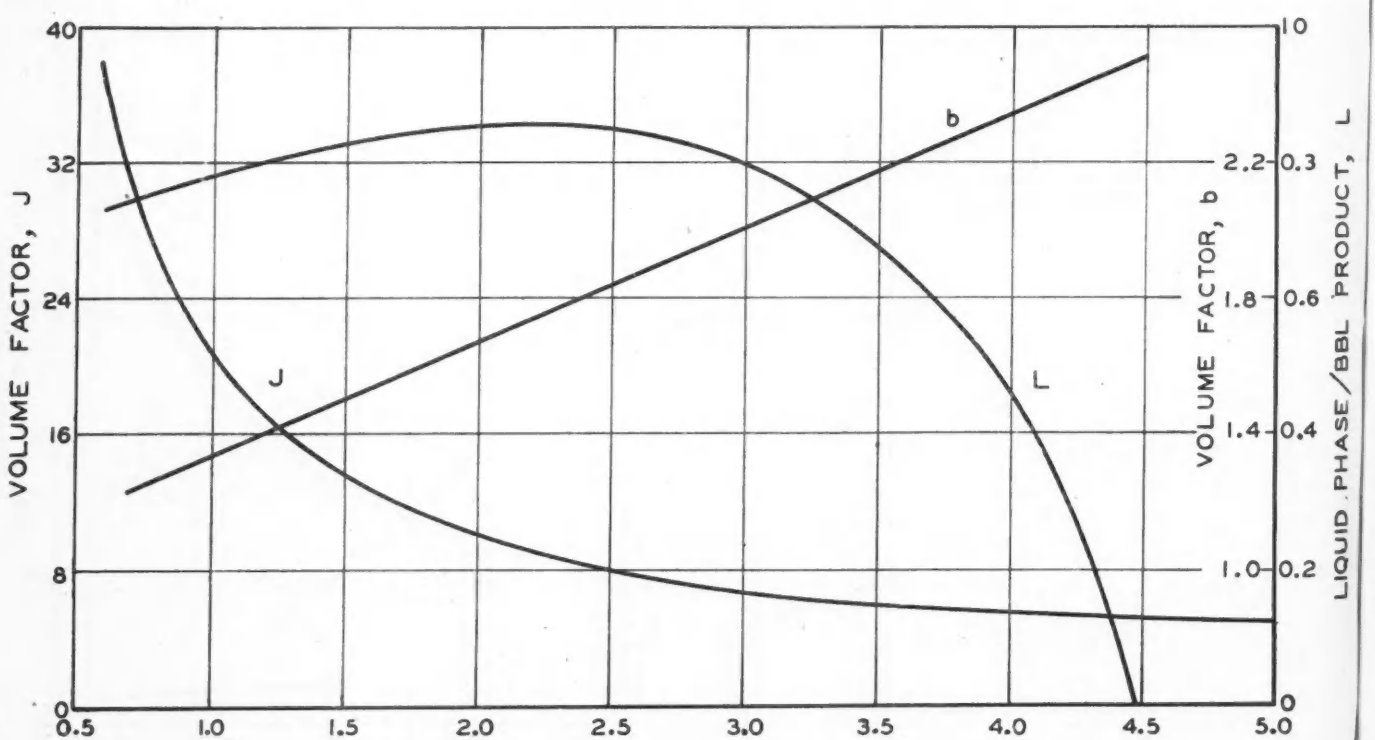


Figure 1-6. Volume factors J and b and liquid phase L for reservoir gas C at 280° F.

Volume Percent Liquid Phase

The barrels of liquid phase per barrel of product divided by the barrels of composite per barrels of product gives the volume percent liquid phase L/J. The L/J curve in Figure 1-3 is for gas A.

Suppose there is no water encroachment for a retrograde gas reservoir in which pressure is declining by virtue of gas phase production. In such instances, reservoir space is practically invariant with respect to pressure and time. If all the liquid phase which condenses from the produced gas and the gas in place were referred to the initial reservoir space, the volume percent liquid phase would be $100L/J_d$ where J_d is the volume factor at dew-point pressure. A fraction of the difference (L/J_d—L/J) remains in a reservoir of invariant space and differential production of gas phase. Field experience indicates that a correction on the order of one-third the said difference should be added to L/J.

Let H equal the volume percent liquid phase relative to an invariant reservoir space. Then H is defined approximately by

$$H = \frac{100L}{3J}\left(2 + \frac{J}{J_d}\right) \qquad (5)$$

The H curve in Figure 1-3 is a solution of equation (5) for reservoir gas A at 212° F. It will be noted that the maximum volume of liquid phase is about 0.61 percent of reservoir space.

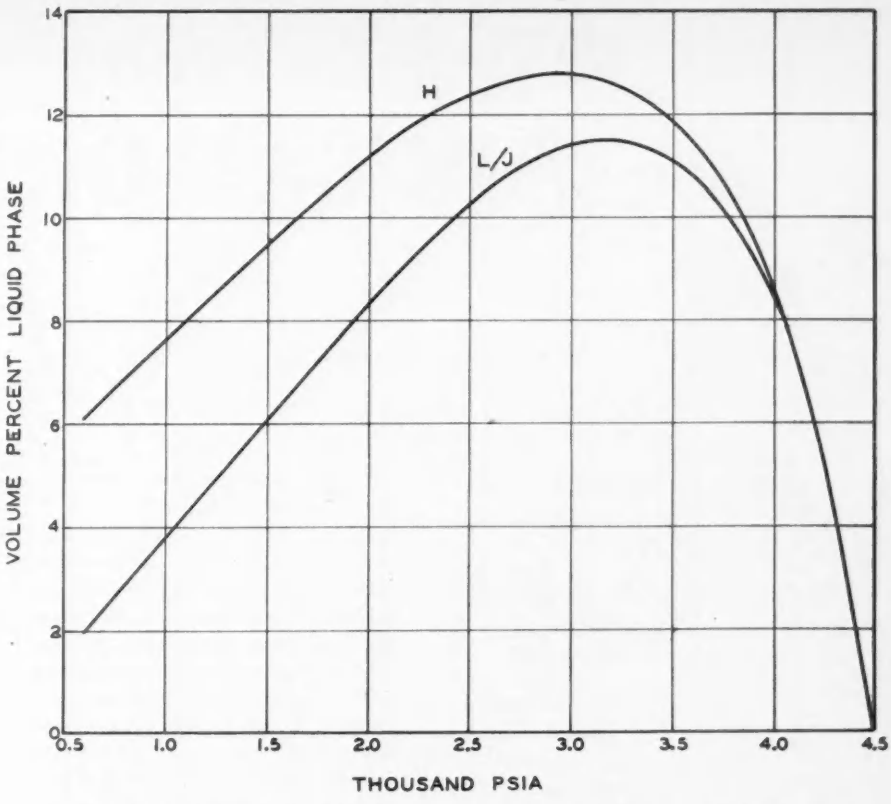


Figure 1-7. Equilibrium, L/J, and estimated differential, H, volume percent liquid phase for reservoir gas C at 200° F.

Reservoir Gas B.

The properties of reservoir gas B are shown in Table 1-2. There are 50.2 barrels of product per million cubic feet. The residue gas product ratio is 19,070 cubic feet per barrel. The dew-point pressure is 4660 psia. Laboratory data for the composite volume factor J and liquid phase per barrels of product L are shown in Figure 1-4. The estimated volume factor for the liquid phase is given by the b curve. The H curve in Figure 1-5 is a solution of equation (5) for reservoir gas B at 220° F. The estimated maximum liquid phase volume in this example is about 3.25 percent of reservoir space.

Reservoir Gas C

The properties of reservoir gas C are itemized in Table 1-3. This gas contains 135.9 barrels of product per million. The residue gas product ratio is 6470 cubic feet per barrel. The dew-point pressure is 4490 psia at 200° F. About 5.11 barrels of space are required to hold one barrel of product at dew-point pressure. Figure 1-6 shows the volumetric and phase behavior. The H curve in Figure 1-7 is a solution of equation (5) for reservoir gas C. The estimated maximum liquid phase volume in this example is about 12.8 percent of reservoir space.

REFERENCES

[1] Patten and Ivey, The Oil Weekly, Dec. 12, 1938.

[2] Pew, James E., The Oil Weekly, Dec. 6, 1943.

[3] Huntington, R. L., The Oil Weekly, June 9, 1941.

[4] Dotterweich and Bennett, The Oil Weekly, May 6, 1946.

[5] Standing and Katz, Trans. AIME (1942) **146**, 159.

[6] Sage and Lacey, Drilling and Production Practice (1941) 308 API, N. Y. (1942).

[7] Olds, Sage and Lacey, Trans. AIME (1945) **160**, 77.

[8] Sage and Lacey, Volumetric and Phase Behavior of Hydrocarbons, Stanford University Press (1939).

[9] NGAA, Tentative Standard Method for calculation of High Pressure Gas Measurement, Dec., 1942.

TABLE 1-1

Properties of Reservoir Gas A

COMPONENT	Mole Percent	PLANT PRODUCT BPMM	PLANT PRODUCT GPM
Methane	95.66	.....	.....
Ethane	1.22	.....	.....
Propane	0.85	.....	.....
Isobutane	0.27	2.10	0.088
N-Butane	0.35	2.63	0.110
Isopentane	0.17	1.48	0.062
N-Pentane	0.11	0.95	0.040
Hexanes	0.20	1.96	0.082
Heptanes+	1.17	18.68	0.785
Total	100.00	27.80	1.167

Mol. wt. C_7+ = 165
Sp. gr. C_7+ = 0.7784
Propane and lighter/butanes plus = 977.3/27.8 = 35.15 MCF/bbl.
Dew-point pressure at 212° F. = 3870 psia.
Volume factor at P_d = 31.07 bbls. space/bbl. product.

TABLE 1-2

Properties of Reservoir Gas B

COMPONENT	Mole Percent	PLANT PRODUCT BPMM	PLANT PRODUCT GPM
Methane	91.06	.....	.....
Ethane	3.21	.....	.....
Propane	1.47	.....	.....
Isobutane	0.46	3.57	0.150
N-Butane	0.61	4.58	0.192
Isopentane	0.32	2.79	0.117
N-Pentane	0.16	1.38	0.058
Hexanes	0.42	4.11	0.173
Heptanes+	2.29	33.77	1.419
Total	100.00	50.20	2.109

Mol. wt. C_7+ = 155
Sp. gr. C_7+ = 0.7924
Propane and lighter/butanes plus = 957.4/50.20 = 19.07 MCF/bbl.
Dew-point pressure at 220° F = 4660 psia.
Volume factor at P_d = 14.33 bbls. space/bbl. product.

TABLE 1-3

Properties of Reservoir Gas C

COMPONENT	Mole Percent	PLANT PRODUCT BPMM	PLANT PRODUCT GPM
Methane	79.91	.....	.....
Ethane	4.73	.....	.....
Propane	3.36	.....	.....
Isobutane	1.80	13.99	0.587
N-Butane	1.42	10.66	0.448
Isopentane	1.04	9.08	0.381
N-Pentane	0.62	5.35	0.225
Hexanes	1.42	13.90	0.584
Heptanes+	5.70	82.94	3.483
Total	100.00	135.92	5.708

Mol. wt. C_7+ = 149.0
Sp. gr. C_7+ = 0.7762
Propane and lighter/butanes plus = 880/135.92 = 6.470 MCF/bbl.
Dew-point pressure at 200° F = 4490 psia.
Volume factor at P_d = 5.110 bbls. space/bbl. product.

Oil Production from Long Cores by

AIR-GAS DRIVE

By R. J. DAY

The Pennsylvania State College

LABORATORY studies of long cores under air or gas drive to determine most advantageous production and secondary recovery methods opens the possibility of selective flowing from higher to lower permeabilities to step up production rates and decrease gas requirements. The experiments and conclusions drawn are based on pressure distributions and relative permeabilities and are thus applicable to operating as well as laboratory conditions.

EXPERIMENTS on the production behavior of long cores under air-gas drive have been reported in several earlier publications.[1,2,3,4] It is the purpose of this paper to present some of the work performed recently.

In previous experiments the need of some estimate of the saturation distribution as well as the pressure distribution along the length of the cores during an air drive was often felt. Measurements of saturation distributions have been made by various investigators using a variety of physical methods. The method to be described here, while subject to certain assumptions, has been valuable in obtaining at least a fair estimate of saturation distributions. The simplicity of the method and the fact that the estimates obtained were reasonably in line with the known total contents of the core, are factors in favor of the method. The procedure is simply the use of the pressure measurements taken at the pressure taps along the core, together with a curve showing the relation between saturation and relative permeability to gas. The saturation and relative permeabilities used in obtaining the curve are averages over the whole core during the air drive (Figure 1).

Figure 2 shows some results obtained on a 500 millidarcy core from the Cow Run sand in Morgan County, Ohio, which was 34 inches in length. The core was extracted and lacquered as described in earlier papers. Three narrow bands around the core dividing the core into four equal sections were left unlacquered, and a piezometer ring was subsequently sealed into place over each of these bands.. After a thorough search for leaks the dry permeability was determined, and the core was then impregnated with a close cut oil of 3.0 centistrokes viscosity and having a density of 0.805 at 25° C. The use of mercury filled manometers of very fine bore provided a fairly accurate and simple means of pressure measurement at the rings with very little displacement volume.

The core was of fairly uniform permeability as shown by the permeabilities of the four sections, 476, 653, 487, and 611 md., respectively. Averaging the reciprocals gives an overall permeability of 546 md. which agrees with the value of 550 obtained by a measurement over the whole core.

Air drives were made using several different inlet pressures on the 100 percent oil-saturated core with the outlet at atmospheric pressure in each case. The progress of the gas phase could be followed by the manometers, and it indicated rather extensive fingering. Air began to emerge at the core outlet when only 6.5 percent of the oil had been produced in the case of the ten cm. run. This tendency of the gas phase to finger through seems to be a trait of all sands. In experiments with a 13 md. core to be described presently, a much larger fraction of the oil was produced before the air broke through, being approximately 15 percent in this case.

Details of the method of calculating the saturations of the various sections are as follows: Knowing the pressure drop and the mean pressure for each section at any time during the experiments, and further assuming that the rate of gas flow calculated to atmospheric pressure was the same through all sections at any particular time, the relative permeability to gas could be calculated at any desired time, since the dry permeabilities were known from each section. Using the relative permeabilities so obtained, the liquid saturations were picked from Figure 1, the relative permeability-saturation curve for the entire core. The average saturation obtained by averaging the calculated saturations of all four sections at any one time agreed fairly well with the overall saturation of the core determined from the amount of oil produced from the core at that time. The agreement was usually within 1 percent until saturations below 40 percent were reached, these being in the more or less unexplored region of the relative permeability curve.

End Effect

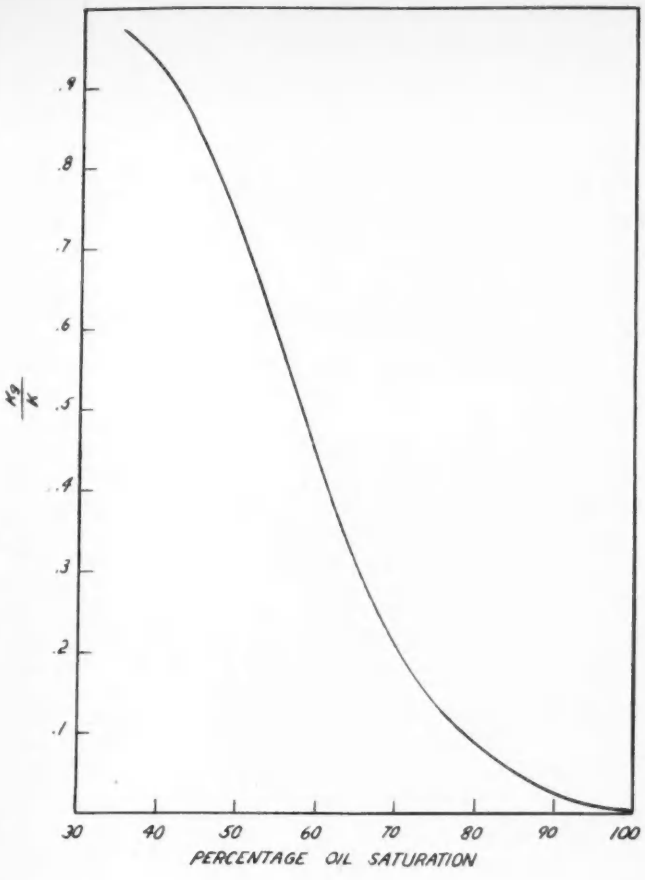
Figure 2 shows the progress of the oil as it moved through the core toward the outlet end. During production one would naturally expect some pile up from continuity considerations. The persistence of this pile up of liquid at the outflow face after production has substantially ceased is referred to as the "end effect." This is due to the forces tending to pull the liquid on the outside face back into the interior of the core. These forces have no opposition from without since the production end is a plane having an infinite radius of curvature and therefore zero capillary attraction. All the counteracting forces must come from within the core, from the emerging liquid and gas which is moved as a result of a pressure gradient. Capillary attraction, or suction, has been re-

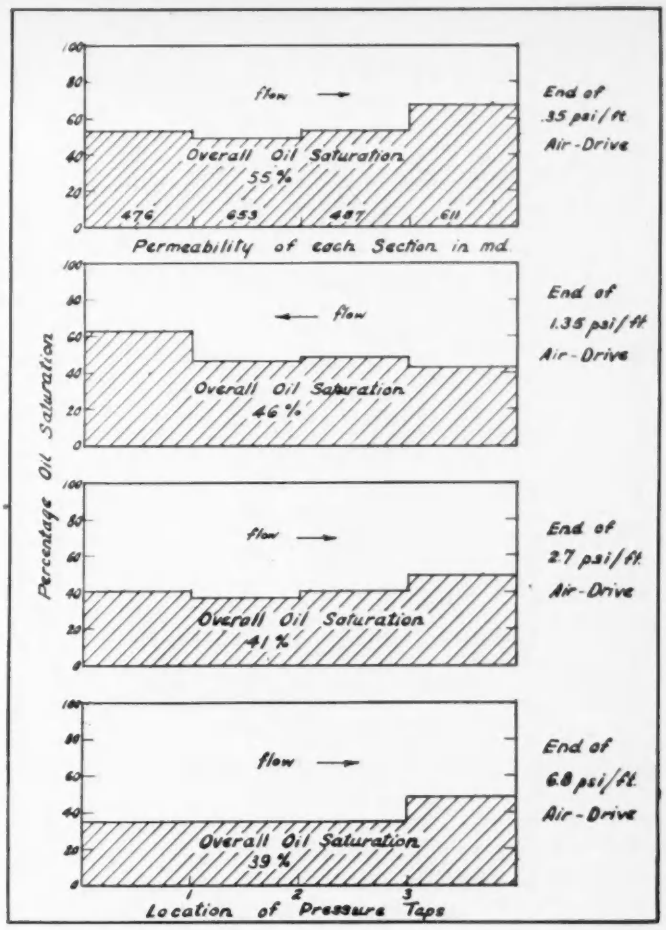
Upper left: **Figure 1. Relative permeability-saturation relationship for 500 md. long core.**

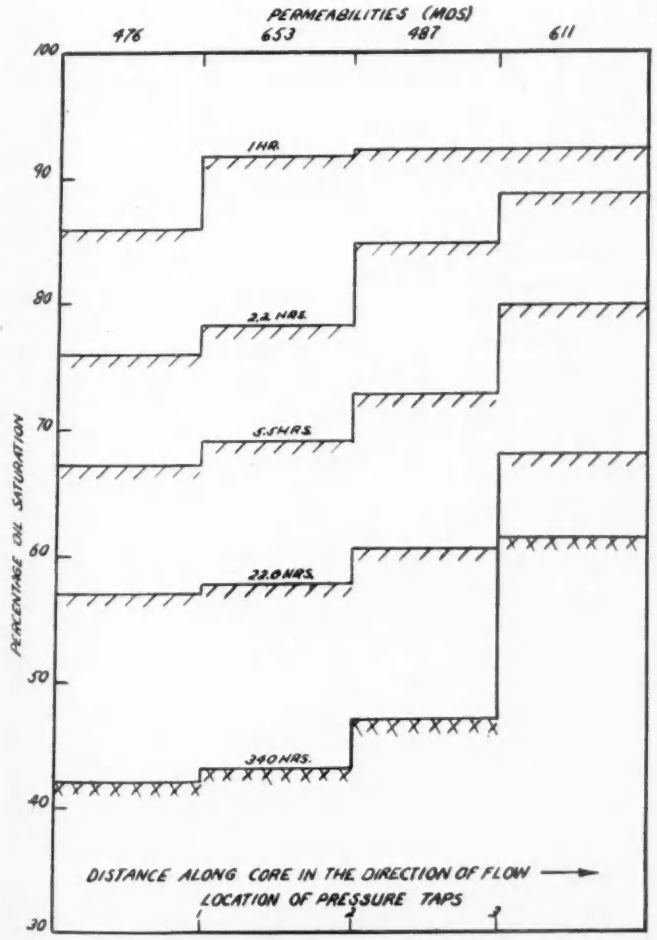
Lower left: **Figure 2. Saturation distribution along core during air drive. 10.0 cm Hg inlet pressure.**

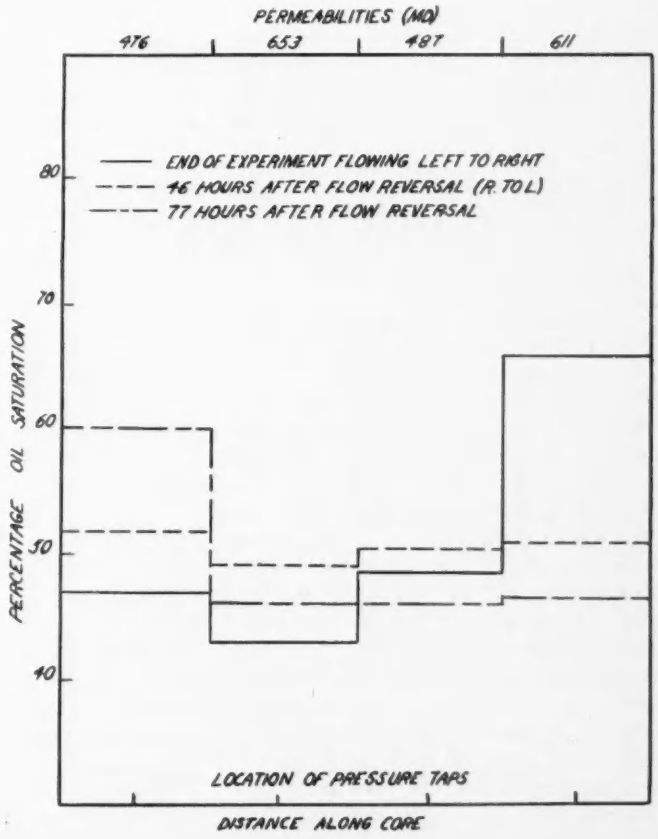
Upper right: **Figure 3. Oil saturation distribution in a 500 md. core.**

Lower right: **Figure 4. Effect of reversal of direction of flow on saturation distributions.**


.9
.8
.7
.6
.5
.4
.3
.2
.1
Kg/K
30
40
50
60
70
80
90
100
PERCENTAGE OIL SATURATION


flow
Overall Oil Saturation 55 %
End of .35 psi/ft Air-Drive
476
653
487
611
Permeability of each Section in md.
flow
Overall Oil Saturation 46 %
End of 1.35 psi/ft Air-Drive
flow
Overall Oil Saturation 41 %
End of 2.7 psi/ft Air-Drive
flow
Overall Oil Saturation 39 %
End of 6.8 psi/ft Air-Drive
Percentage Oil Saturation
1
2
3
Location of Pressure Taps


PERMEABILITIES (MDS)
476
653
487
611
1 HR.
2.2 HRS.
5.5 HRS.
22.0 HRS.
340 HRS.
PERCENTAGE OIL SATURATION
DISTANCE ALONG CORE IN THE DIRECTION OF FLOW
LOCATION OF PRESSURE TAPS


PERMEABILITIES (MD)
476
653
487
611
END OF EXPERIMENT FLOWING LEFT TO RIGHT
16 HOURS AFTER FLOW REVERSAL (R. TO L.)
77 HOURS AFTER FLOW REVERSAL
PERCENTAGE OIL SATURATION
LOCATION OF PRESSURE TAPS
DISTANCE ALONG CORE

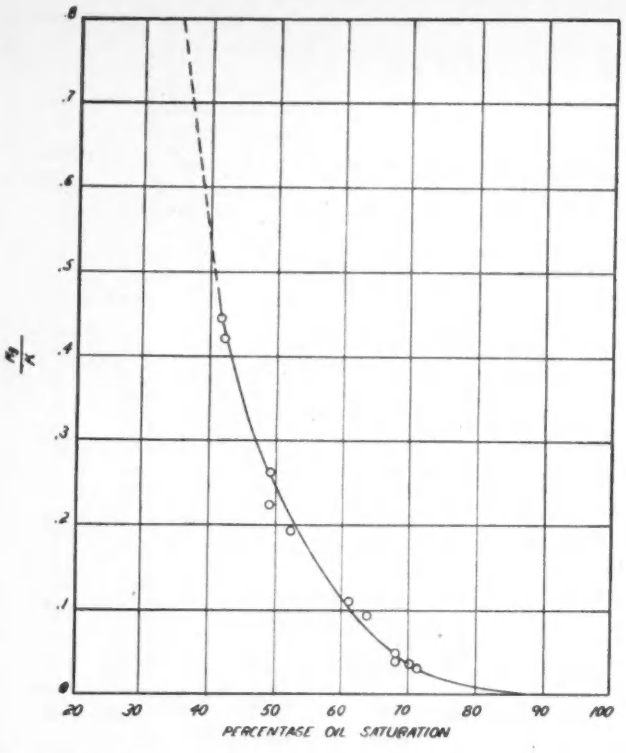


Figure 5. Relative permeability saturation relationship for 13 md. long core.

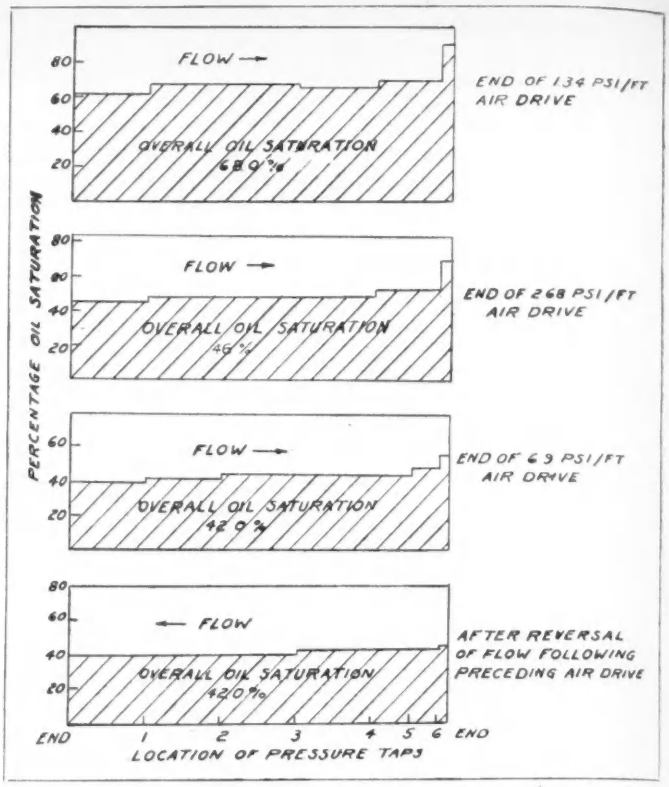


Figure 6. Oil saturation distribution in a 13 md. core.

ferred to as a capillary pressure in the literature and as such is treated as a negative pressure.

Figure 3 shows the saturation distributions resulting from the application of various pressure gradients after equilibrium had been approximated. The capillary pressure-saturation-permeability relationships governing the saturation distributions have been discussed in the literature.[5,6] To account quantitatively for the saturation distribution requires an independently determined capillary pressure vs. saturation curve for the sand in question. Such determinations are under way in this laboratory. Since Section 1 is the greatest distance from the disturbing influence at the exit end, its behavior should approach that of the major portion of an oil reservoir not adjacent to any well.

A change in the relative permeability of cores has often been noticed when they were allowed to stand for a while after air flow had been stopped. This suggested a rearrangement of the saturation distributions, in view of capillary pressure considerations. Reversing the direction of flow should partially reverse the saturation distribution. This is borne out in Figure 4, which shows the results of reversing the air flow after production had substantially stopped. The overall saturation of the core was 50 percent at the time of flow reversal, requiring 1800 pore volumes of gas for its attainment. It required 400 pore volumes more to reach a state of fairly uniform saturation throughout the core after flow reversal. This shows the extremely low relative permeability to liquid at 50 percent saturation for this sand.

Just how far the end effect extended into the core is not known except that it is located in the end section, as shown by Figures 3 and 4. The determination of its exact position is limited by the location of the pressure taps. Since the problem is of interest because of its bearing on the interpretation of laboratory data and their applications to field behavior, experiments similar to the above were made with other cores in which the pressure taps were located closer to the producing ends. Due to the smaller pressure differences between the more closely spaced taps, use was made of dibutylphthalate and tetrabromethane as manometer liquids at the outlet ends. Whenever closely spaced taps occurred at the inlet ends, differential manometers were used. One of the cores studied was a Venango core of low permeability, averaging about 13 md. This had a length of 43 inches and was equipped with piezometer rings located as shown in Figure 6. The permeabilities by sections are as follows:

Section No.	1	2	3	4	5	6	7
Permeability, md.	9.5	13.4	22.4	17.1	13.6	12.4	8.4
Percent of total volume	20	20	20	20	10	7	3

The saturation vs. gas permeability curve for the entire core, used in obtaining the saturation distributions, is shown in Figure 5.

In order to avoid errors that might be incurred in the relative permeability-saturation measurements by the liquid pile up at the end, the data for Figures 1 and 5 were obtained as follows: After the core had been produced to a certain saturation it was stopped and the direction of flow reversed. It was found that the relative permeability of the core would go through a maximum and then decrease again with time corresponding to the rearrangement of its contents as shown in Figure 4. This maximum point was taken as the one of most uniform saturation distribution and the value so obtained used in plotting the relative permeability curve. This procedure was then repeated for other saturations. Four saturation distributions are shown in Figure 6. Three are at the close of three different pressure gradient applications when production had practically ceased in each case. The fourth shows the saturation distribution after the direction of flow had been reversed for several hours.

The end effect seems to be concentrated in the last 3 percent of the core length, which amounts to 1¼ inches. How much closer to the outlet end it may be concentrated cannot be known with the present location of the pressure taps. When the overall saturation of the core minus the last section is considered, the saturation is more or less uniform. It is quite possible that the minor variations observed may be due to experimental errors or local variations in the relative permeability-saturation relationship. That the end effect can be made to disappear is demonstrated by the fourth part of Figure 6 in which the direction of flow had been reversed. In

this case the saturation distribution was quite uniform. It is felt that the end effect would have reappeared at the other end if a sufficiently long time had been allowed for the establishment of equilibrium.

It is believed that at the outlet face of the core the liquid saturation is the highest which will just allow gas to flow. This was 90 to 95 percent for the Cow Run cores and 80 to 85 percent for the Venango core.

Effect of Irregular Permeability

Both the cores described above were of fairly uniform permeability. However, one of the long cores studied, also from the Cow Run sand, proved to have a very irregular permeability profile. The core had been used in experiments previously, but it was not until pressure rings were placed on the core that its irregular permeability was noticed. The following table shows the spacing of the rings, the permeability distribution, and the percentage of the total core volume that is contained in each individual section:

Section	1	2	3	4	5	6	7	8	9
Length, cm.	3.0	6.0	6.0	20.7	20.7	20.7	6.0	6.0	3.0
Permeability, md.	147	198	211	114	80	114	116	66	30
Percent of Core Volume	3.3	6.5	6.5	22.5	22.5	22.5	6.5	6.5	3.3

It is seen that one of the large middle sections (5), and especially the two end sections (8) and (9), have permeabilities that are appreciably lower than the average of the rest of the core.

The agreement between the calculated overall saturations and the actual were not as close for this core as was obtained for the more uniform cores, the deviation being about 5 percent. The calculated saturation distributions are shown in Figure 7. Despite the loose agreement, a fair idea of the relative saturation distribution may be obtained, however.

Regardless of the direction of flow, the end effect is concentrated rather closely to the producing end. The effect of permeability and capillary pressure on the relative saturations is also apparent. This core came from the same sand and has the same texture as the first core discussed, so it would be expected to behave similarly. It would seem that the end effect was concentrated closer to the producing end than it was previously possible to detect. Furthermore, it is concentrated closer to the producing end in these consolidated cores than it has been found to be in the unconsolidated sands reported so far. This difference may be due to the different type of interstices present in the consolidated and unconsolidated sands.

It was suspected that this core would show considerable differences in production behavior depending on the direction of flow. The core was therefore air-driven under 20 cm. mercury pressure differential, starting with complete saturation by the close cut oil. The run was then repeated, flowing in the opposite direction. Figures 8 and 9 show the percentage saturation vs. log time and percentage saturation vs. log gas volume curves. A difference in behavior is noted depending upon the direction in which the core is flowed. All conditions except the direction of flow have been kept constant. When flowing in such a way that the low permeability sections are at the producing end, the ultimate production is greater by some 9 percent, the rate of production is faster, and the amount of gas necessary for production is much less. By consulting Figure 9 it can be seen that five times as much gas is necessary to reach a saturation of 60 percent when flowing from the low permeability sections than when flowing toward them.

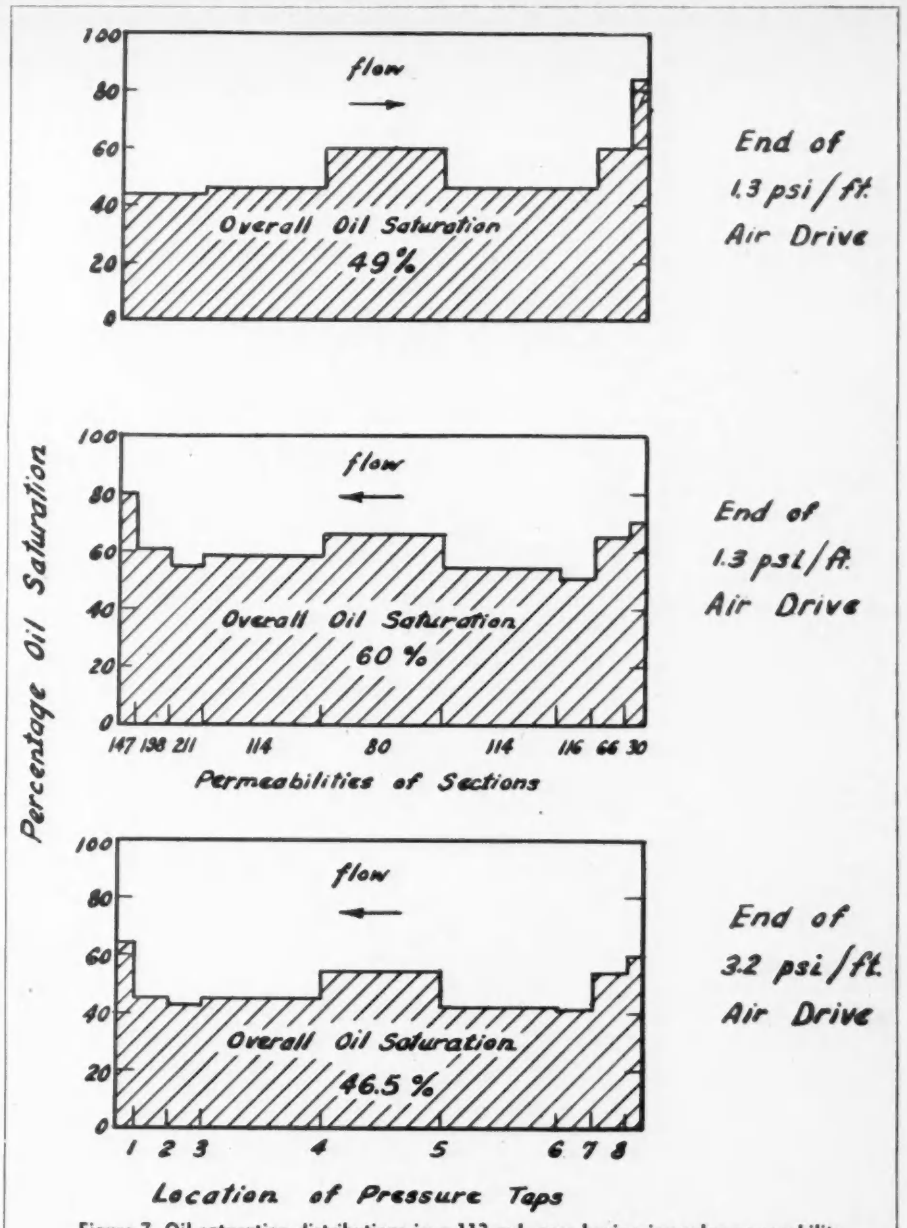
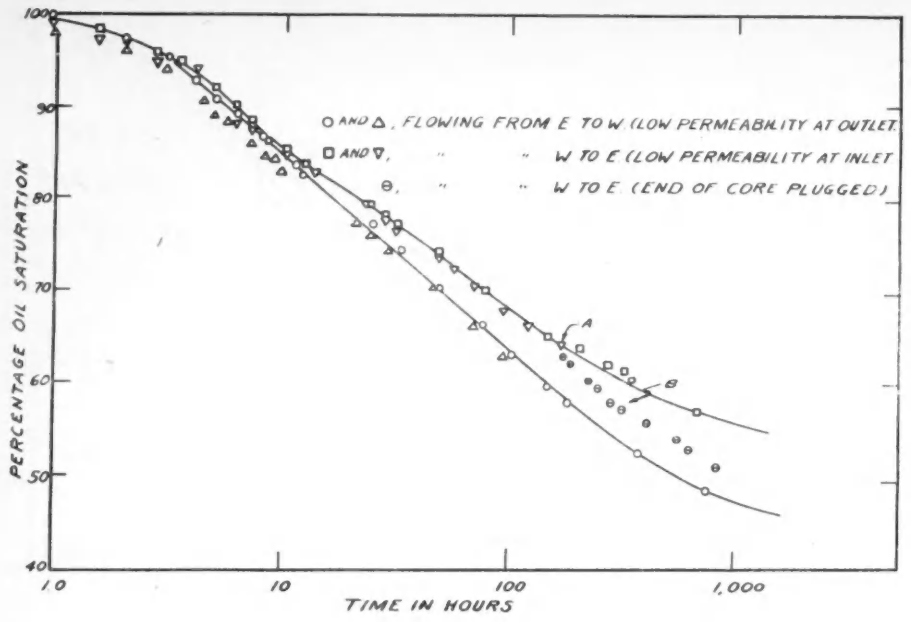


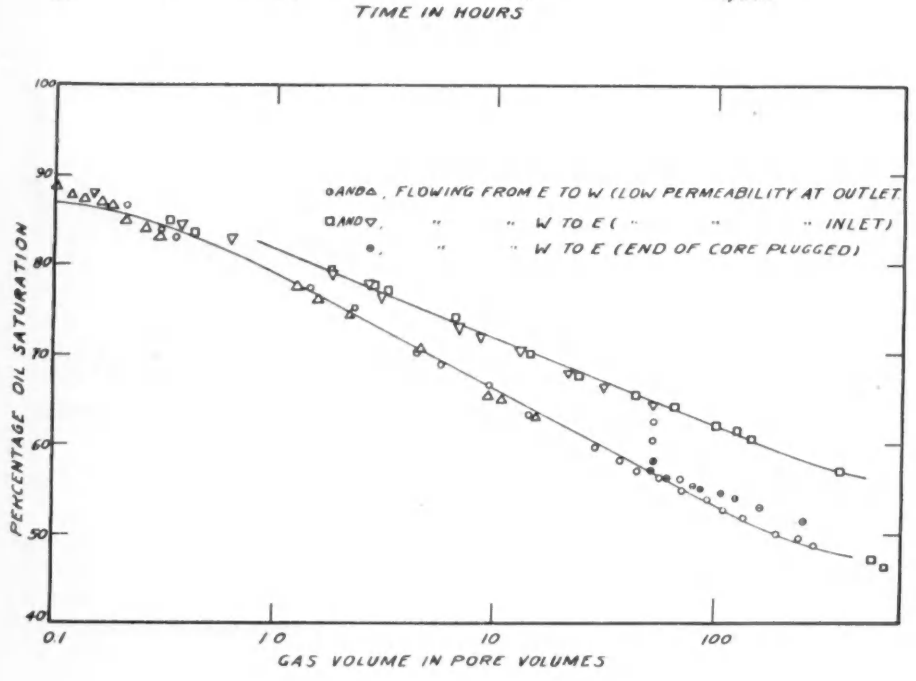
Figure 7. Oil saturation distributions in a 113 md. core having irregular permeability.

To show that the direction of flow is immaterial in the case of a core of fairly uniform permeability, runs were made at the same gradient in opposite directions on the 13 md. core described previously, starting in each case with 100 percent saturation by the close cut oil. The results are shown in Figure 10, together with the saturation vs. log gas volume curves for two other gradients. It is seen that the curve for flowing in one direction is an exact duplicate of that for flowing in the opposite direction at the same gradient. This was true for both the rate of production and the volumes of gas required.

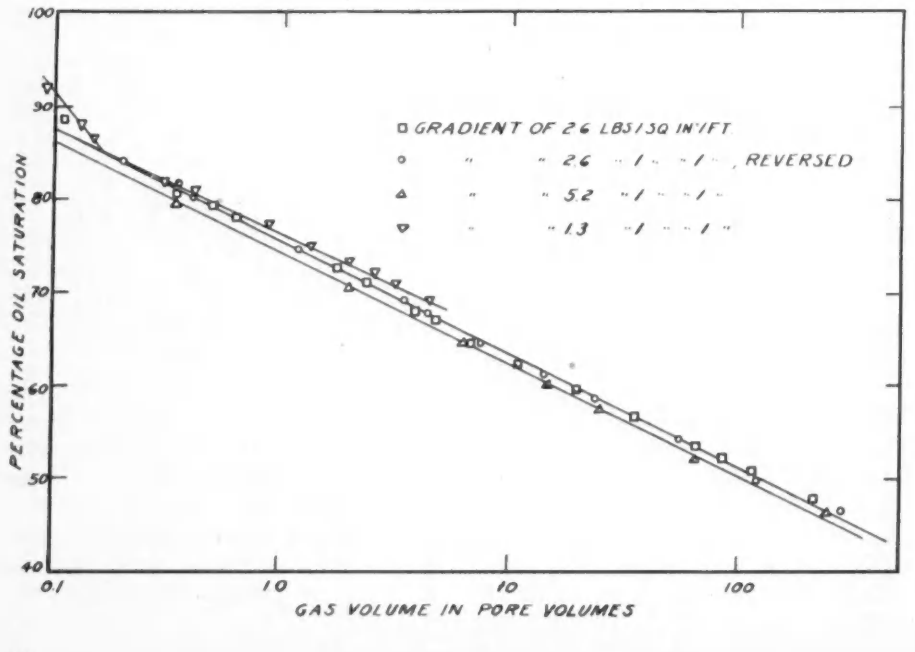
Because the behavior of the core with the heterogeneous permeability had been so unusual, the experiments were re-


PERCENTAGE OIL SATURATION
TIME IN HOURS
O AND Δ, FLOWING FROM E TO W (LOW PERMEABILITY AT OUTLET)
□ AND ▽, " " W TO E (LOW PERMEABILITY AT INLET)
Θ, " " W TO E (END OF CORE PLUGGED)
A
B

Top: **Figure 8. Effect of a low permeability end on production from a long core.**


PERCENTAGE OIL SATURATION
GAS VOLUME IN PORE VOLUMES
O AND Δ, FLOWING FROM E TO W (LOW PERMEABILITY AT OUTLET)
□ AND ▽, " " W TO E (" " " INLET)
●, " " W TO E (END OF CORE PLUGGED)

Center: **Figure 9. Effect of a low permeability end on production from a long core.**



Below: **Figure 10. Effect of gradient and direction of flow on gas throughput vs saturation curves for 13 md. long core.**

peated to make sure that no experimental errors had been made. This resulted in the exact duplication of the previous results as is shown in Figures 8 and 9, the points of the duplicate runs being marked differently from those of the first runs. Not until the input pressure had been increased to 50 cm. of mercury was the production behavior, when flowing with the low permeability at the inlet, equal to that when flowing in the opposite direction under 20 cm. of mercury.

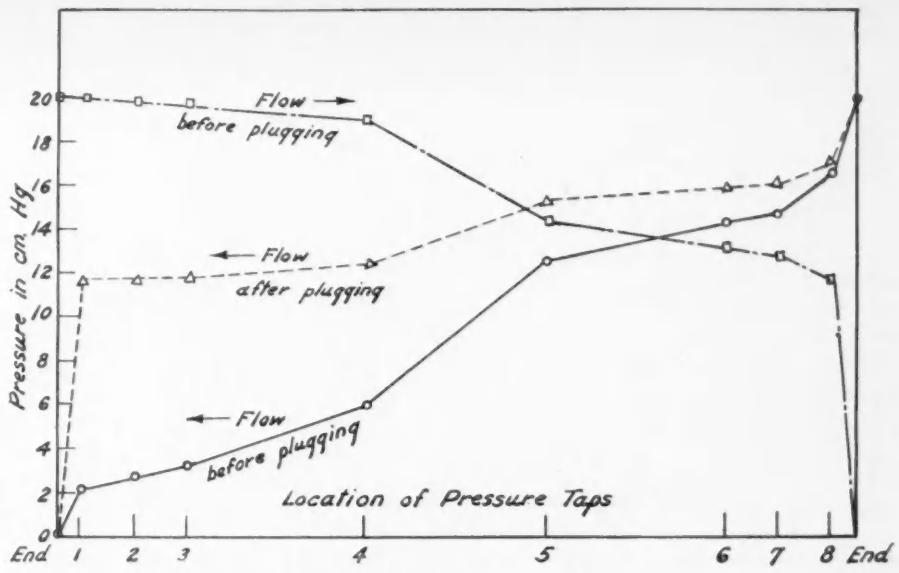
Pressure Distributions

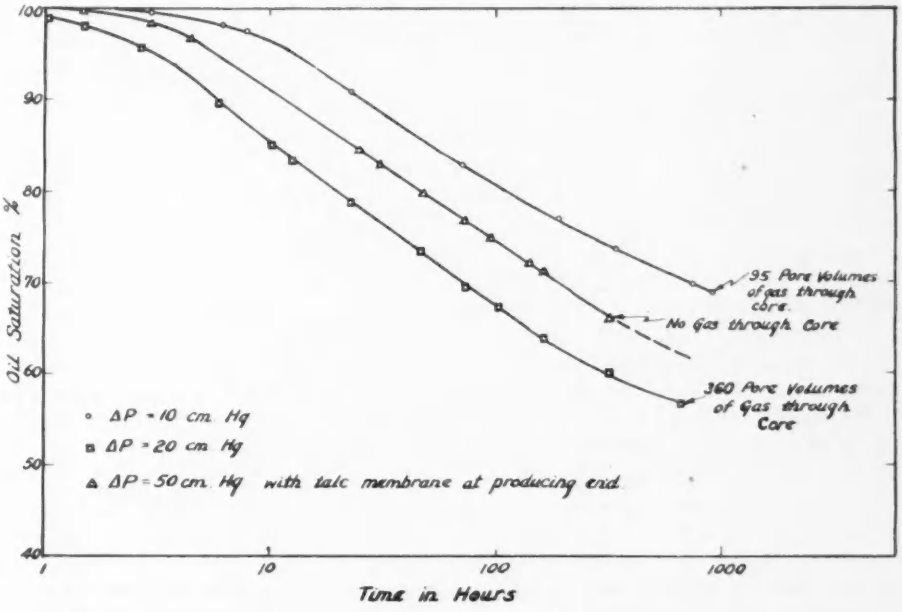
The solid lines in Figure 11 show the pressure distributions along the core when the overall saturations were 57 percent. From this figure it can be seen that the pressure gradient does not explain the more efficient production when the core is flowed toward the low permeability end, because the gradient across every section except the last is greater when flowing toward the more permeable section. If the gradient across the producing end section, which accounts for only 3.3 percent of the core volume, is neglected and only the gradient over the rest of the core is considered, it is found that the measured gradients are in a ratio of 18 to 8 but that the smaller gradient has the greater and more efficient production. The explanation probably lies in gradients set up in the liquid phase due to the dependence of capillary pressure on permeability as well as on saturation.

Permeability, threshold pressure and capillary pressure are so related that normally with a decrease in permeability an increase in the capillary pressure at almost any given saturation and an increase in threshold pressure would be expected. Since different sands vary in texture and pore size distribution this will not hold completely, but in general this behavior will hold. Figure 7 demonstrates the greater capillary attraction for oil of the lower permeability sections. While the low permeability section (3.0 md.) was at the producing end it acted as a blotter drawing oil from the more permeable sections even though its saturation was higher. As oil was produced from the end, more oil

Top: **Figure 11.. Pressure distribution in a core of irregular permeability.**

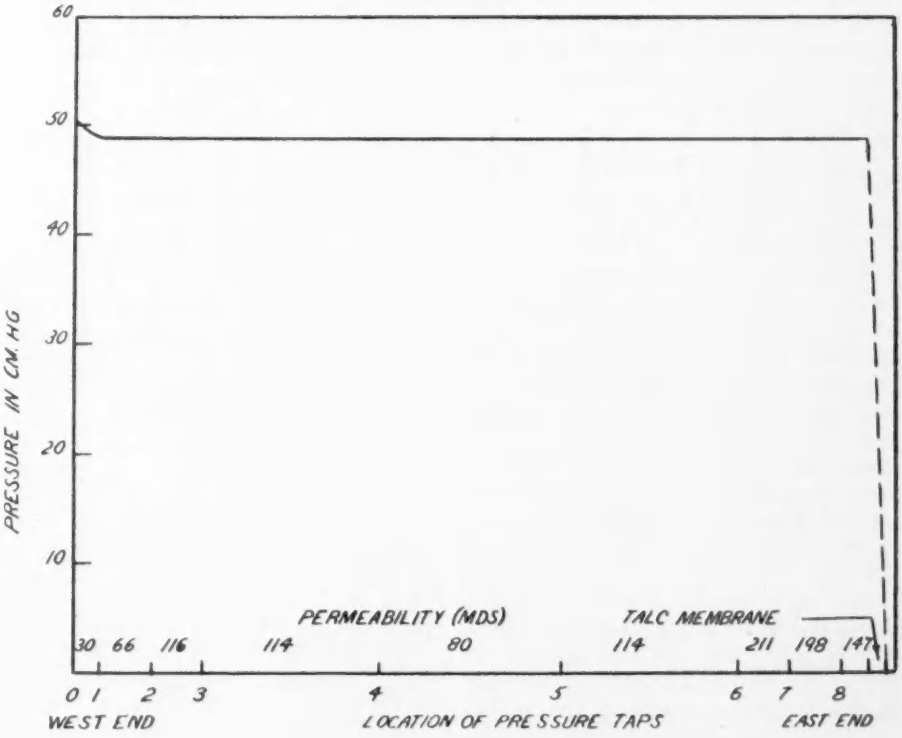
Center: **Figure 12. Saturation vs time curves for 113 md. core with and without talc membrane.**




Oil Saturation %
95 Pore Volumes of gas through core.
No Gas through Core
360 Pore Volumes of Gas through Core
ΔP = 10 cm. Hg
ΔP = 20 cm. Hg
ΔP = 50 cm. Hg with talc membrane at producing end.
Time in Hours

was drawn from the adjacent sections. Oil was thereby moved toward the producing end, the driving force at every stage being the difference between the capillary attraction of the various sections. This holds whether air has broken through the producing end or not. Conversely, when the low permeability section was at the inlet end the capillary attraction was in opposition to the direction of flow, then the saturations, as shown in Figure 7, at which the forces throughout this whole core became balanced were relatively higher.

To test further the theory, the core was produced down to a saturation of 64 percent by flowing in the less efficient direction under 20 cm. pressure differential, that is, to point "A" on the upper curve in Figures 8 and 9. Then a low permeability diaphragm composed of a paste of very fine talc mixed with the saturating oil was placed against the producing end of the core. A pressure of 20 cm. mercury was applied, and production was noted as shown in Figure 8 and 9. About 7 percent more oil was produced, starting from 64 percent saturation, without any gas breaking through the diaphragm. Unfortunately, too great a pressure had been placed on the diaphragm in tightening it up, and the ceramic backing broke at point "B" in Figures 8 and 9. However, enough of the finely divided talc was forced into the producing end of the core to cause a considerable decrease in conductivity. After removing the broken diaphragm, the experiment was resumed from point "B" with the end of the core plugged with talc. The pressure distribution of the core after it was plugged is shown by the dotted line in Figure 11. There was a large increase in resistance to flow of the last section due to the plugging action. From Figure 11 it may be roughly estimated that the permeability of the end section had been reduced to about 30 md. from 150 md. With both ends now having a high resistance to flow, the pressure drop across the main body of the core was reduced to 27 percent of the total pressure drop, the remaining 73 percent being across the entrance and exit ends. The oil production remained almost as high as it was before


PRESSURE IN CM. HG
PERMEABILITY (MDS)
30 66 116 114 80 114 211 198 147
TALC MEMBRANE
0 1 2 3 4 5 6 7 8
WEST END
LOCATION OF PRESSURE TAPS
EAST END

Below: **Figure 13. Pressure distribution for a 113 md. core with a talc membrane at producing end of core during air drive. Flow →**

plugging, when the gradient across the main body of the core was raised to its former value, with much less air being produced. The advantages of flowing toward a low permeability section were thus realized by artificially reducing the permeability of the producing end of the core.

The use of diaphragms for decreasing gas-oil ratios has been used on unconsolidated sands and their practical application proposed.[6]

The same core was again 100 percent oil saturated and mounted with the talc membrane at the producing end. A pressure difference of 50 cm. of mercury was used to drive the core. Figure 12 shows a plot of oil saturations vs. time for runs with and without the tale membrane. It is seen that about 34 percent of the oil was produced in 300 hours, with no gas being produced. This is a slower production rate than was obtained with 20 cm. of mercury without the membrane but not as slow as with 10 cm. of mercury without the membrane. However, it will be noted from Figure 13 which shows the pressure distribution in the core when driven with the membrane, that 96 percent of the pressure differential is lost in the membrane. It is noteworthy that with so small a gradient over most of the core (2 cm. of mercury differential exclusive of the membrane) the production rate is still about as high as with 15 cm. differential and no membrane. These runs were terminated at the saturations given, since oil production had become extremely small.

The core was also repressured with air while having a 15 to 20 percent water saturation in conjunction with oil. A membrane of hydrophobic material was placed at the producing end which resulted in the production of oil only, no water or air being produced. However, higher water saturations would have to be investigated before any definite claims could be made.

Although it would be ideal to be able to apply a membrane that would be permeable to oil only, it may be impossible to accomplish this economically. Such a membrane would of necessity have to be tight, thereby greatly reducing the oil production rate. However, low permeability diaphragms which allow the passage of both oil and water should be investigated. By a study of the capillary pressure-saturation relationships for various low permeability diaphragms a technique might be devised whereby gas-oil ratios in the air-gas drive region might be substantially reduced. Large decreases in gas-oil ratio would involve rather tight diaphragms with subsequent decreases in oil production rates. Both factors would have to be balanced for each individual case until the reduction in gas-oil ratio compensated for the decrease in production rate. With a decrease in the gas-oil ratio effected, it might then be possible to increase the injection pressure, thus increasing the production rate and the ultimate production.

This method might also aid in combating bypassing. Certainly the tendency for gas to rush through the loose sands would be appreciably cut. The possibility of the action to be selective is not too remote. The diaphragm material would penetrate the looser sands to a greater extent for a given amount of squeeze placed upon the material.

From these experiments it would seem that it is more advantageous to treat a producing well rather than an input in order to decrease the gas-oil ratio, reduce bypassing and increase recoveries. Certainly Figures 8, 9, and 12 show that treatment of the producer and not the input well is the more efficient way. The more correct procedure would appear to be open up or increase the conductivity of the input and to partially increase the resistance at the producing well. This phenomenon certainly warrants further and more extensive study in the laboratory and then, if still found promising, a trial in the field.

Summary

1. Production data for oil saturated long cores under air drive were presented, together with an estimate of the saturation distributions based on pressure distributions and relative permeabilities.

2. In the case of certain sands, production is faster and less gas is required to reach a certain saturation when flowing from a higher to a lower permability than when flowing in the reverse direction. The possibility of applications of this fact to field practice was suggested.

3. The use of a diaphragm impervious to gas or to water and gas at the producing end of a core is described.

Acknowledgments

The writer wishes to thank Mr. D. E. Menzie for running the diaphragm experiments used for Figures 12 and 13. He also wishes to thank S. T. Yuster, R. F. Nielsen and members of the staff of the Division of Petroleum and Natural Gas Engineering for their interest and help and members of the Pennsylvania Grade Crude Oil Association for their support of this work.

REFERENCES

[1] Krutter and Day, "Air Drive Experiments on Long Horizontal Consolidated Cores," Petroleum Technology (A.I.M.E.), November, 1943.

[2] Day and Yuster, "The Mechanism of Gas Drive," Bulletin No. 39, Mineral Industries Experiment Station, The Pennsylvania State College.

[3] Day and Yuster, "Prediction of Behavior in Air-Gas Drive," Bulletin No. 41, Mineral Industries Experiment Station.

[4] Yuster and Day, "Gas Requirements in Gas Drive Recovery," A.P.I. Division of Production Eastern District Meeting, June 13, 1946.

[5] Leverett, "Capillary Behavior in Porous Solids," T. P. 1223, A.I.M.E., 1941.

[6] Hassler, Brunner, and Deahl, "The Role of Capillarity in Oil Production," T. P. 1623, A.I.M.E., 1943.

Domestic Oil Producers Set Another Record During May

Domestic oil producers hung up another new record of output in May with a daily average of 5,033,000 barrels, topping the April record by 59,000 barrels, the Bureau of Mines reported last week.

Texas and Louisiana made new highs with increases of 47,000 barrels daily in the former and 4000 barrels in the latter, California production was upped 6000 barrels and lesser increases were reported in several other states.

Sharply increased activity was reported in other directions. Oil well completions jumped from 1247 in April to 1626 in May, due to large gains in the Southwest, Appalachian and California areas. Active drilling rigs increased from 3797 to 4455 during the month.

Demand for domestic crude increased by 267,000 barrels daily to a total of 4,992,000 barrels, but the industry still had approximately 41,000 barrels daily of crude to put into stocks and total crude stocks, domestic and foreign, increased from 241,663,000 barrels April 30 to 243,593,000 barrels May 31, the bureau reported.

Crude runs to stills jumped 240,000 barrels daily during May, from 4,707,000 to 4,947,000 barrels, and while it was necessary to draw on stocks for 6 million barrels of gasoline, refiners were able to add 3½ million barrels to residual fuel stocks, 4 million barrels to distillate stocks and 3 million barrels to kerosine inventories.

Reporting on supply and demand, the bureau showed that domestic crude production amounted to 156,024,000 barrels in May against 149,228,000 barrels in April which, with 10,342,000 barrels of natural gasoline, etc., against 10,753,000 barrels, and 50,000 barrels of benzol unchanged, gave a total production of 166,416,000 barrels against 160,031,000 barrels. With imports of 8,703,000 barrels of crude against 7,276,000 in April and 5,625,000 barrels of products against 5,913,000 barrels, the total new supply, all oils, was 180,744,000 barrels against 173,220,000 barrels.

Total demand in May was 172,944,000 barrels against 171,184,000 in April, with the daily average dropping to 5,579,000 from 5,706,000 barrels. Exports included 4,789,000 barrels of crude, against 3,842,000 in April, and 9,523,000 barrels of products against 11,248,000, with a domestic demand as follows:

Motor fuel, 70,865,000 barrels against 63,406,000; kerosine, 6,068,000 against 8,082,000; distillate fuel oil, 19,262,000 against 21,321,000; residual fuel oil, 40,057,000 against 42,140,000; lubricating oil 3,104,000 against 3,066,000; wax, 219,000 against 225,000; coke 888,000 against 792,000; asphalt, 3,859,000 against 3,027,000; road oil, 418,000 against 242,000; still gas 7,445,000 against 6,839,000; liquefied gases, 3,566,000 against 4,054,000; other miscellaneous, 325,000 against 368,000; losses, 2,566,000 against 2,532,000; total 158,632,000 against 156,094,000.

Stocks at the close of the month included 237,768,000 barrels of gasoline-bearing crude against 235,710,000 April 30; 5,825,000 barrels of heavy crude in California against 5,953,000; 5,566,000 natural gasoline, etc., against 5,604,000, and 241,945,000 of refined products against 236,037,000, a total, all oils, of 491,104,000 barrels, or 88 days' supply, against 483,304,000 barrels, of 85 days.

The Bureau of Labor Statistics price index for crude and products was 86.8 in May against 86.3 in April and 63.5 in May, 1946.

Lease Hearing Set

Texas' Land Commissioner Bascom Giles said last week that August 18 has been agreed on tentatively as the date for the hearing on the extension of offshore leases under HB 17 passed by the state's 50th Legislature.

The observer merely checks the functioning of the recording unit as the car is driven over roads which, when possible, should form a cross-hatched pattern over the area to be surveyed.

Radiographic Method OF GEOPHYSICAL EXPLORATION

By M. S. BLACKBURN

RADIOGRAPHIC SURVEYS, taken as the transporting car crosses an area at speeds up to 50 miles per hour, offer a new correlating medium for determining the areas which are worthy of intensive exploration through other media. The method utilizes shielding effects on radio phenomena, and takes advantage of environmental changes in sedimentary zones.

THE physical background and the theoretical possibilities of the radiographic method of geophysical prospecting are here compared with other methods. The radiographic method is in reality an electromagnetic method, designed to measure radio field intensities by a continuous automatic recording arrangement that eliminates all personal equations. From these records (made at speeds up to 50 miles per hour) subsurface anomalies can be determined, iso-intensity contour maps of structures can be made, and the surface trace of faults delineated. A rigorous mathematical treatment of these records for the determination of depth is not at present possible; however, this lack of very desirable knowledge is not a serious handicap since it is overcome by the rapidity and economy of reconnaissance work, and the depth can be determined by other methods.

In presenting this report on the radiographic method of geophysical exploration, the explanations will be confined to references to the electromagnetic laws governing radiant energy and such additional points as the oil producer is interested in:

1. Will the automatic record over any traverse repeat itself on any number of subsequent runs? The answer is YES.

2. Is the interpretation subject to mathematical treatment? YES.

3. Is it teachable? YES, to anyone knowing the fundamental electromagnetic laws and their application to the propagation of radio waves and/or electromagnetic fields.

4. Does the field crew have to stop to take a reading? NO. All records are made on a continuous graph made at the rate of up to 50 miles per hour, depending on the condition of the road being surveyed.

5. What types of structure can be located? A fault, a nose on a fault, an anticline, a syncline or normal dip.

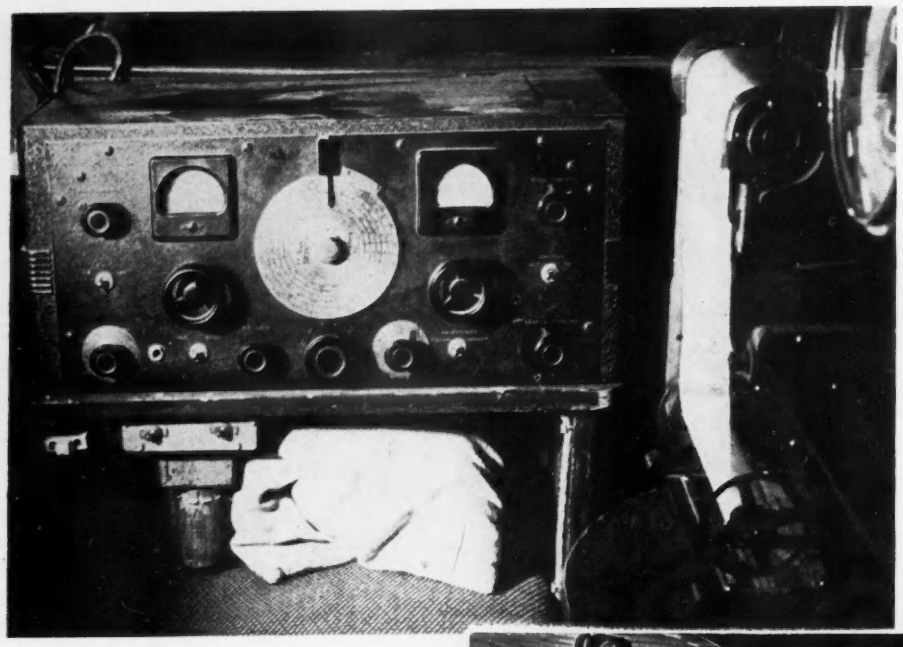
6. Can depth be determined? At present, it is impossible to compute the depth of any structure; the method is limited to determining the location, hade and direction of a fault. In other types of structure it is limited to giving the surface location directly above a structure, the direction of its major axis and the degree of dip from a geoid of reference which allows the calculation of the amount of relief.

High speed of operation means a lower cost per acre, together with getting the desired information sooner. Now, if the data acquired by the radiographic method are as reliable as other data, then it should be the best method to use for reconnaissance work; in collaboration with the seismic method, both location and depth can be determined.

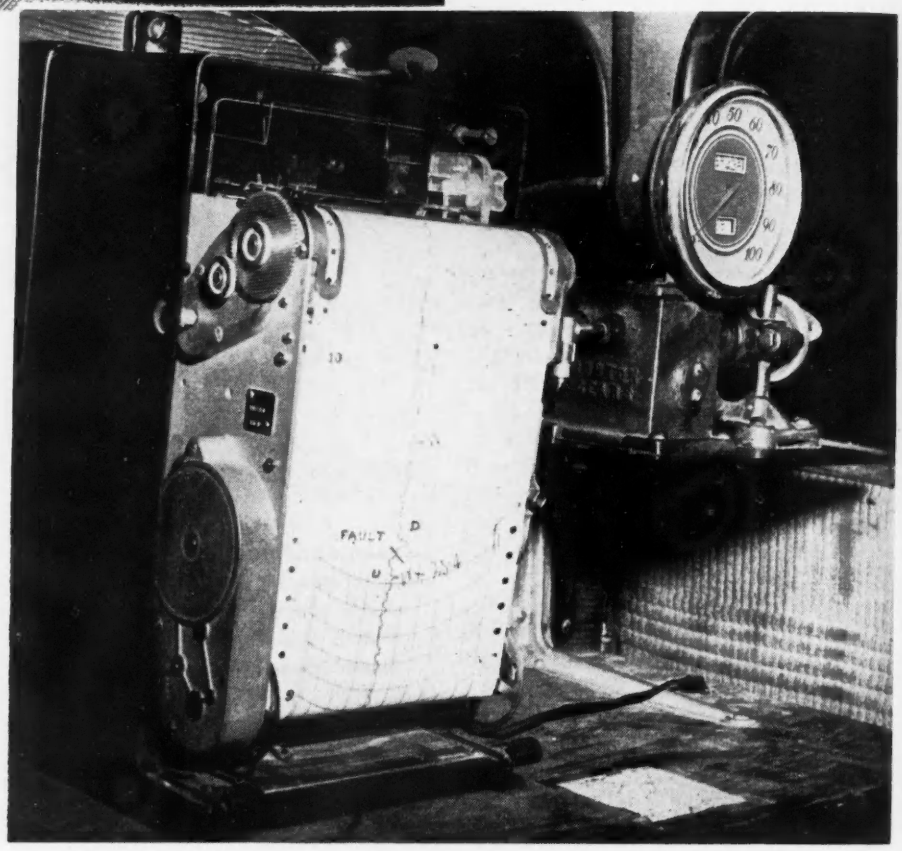
Gravity meter surveys use spot readings at certain intervals but can not furnish a continuous record. Gravity records are subject to personal equations, due to visual operation. In most cases, the meter must be set up for each reading; therefore, it is less than one-tenth as fast as the Blackburn radiographic method.

Seismic methods cost much more per acre, are slower, and they can not always find a fault where one exists, but the cost of seismic work can be greatly reduced by a proper combination with the radiographic method. The most practical arrangement appears to be the use of the radiographic method in reconnaissance work, to eliminate the definitely unproductive areas and to throw into focus the possible productive prospects, and then to apply the seismic method to these prospects.

Users of a car radio have noticed that the reception fades out when driving



The record is made with these two units, mounted behind the front seat of the two-door car which serves to transport the equipment and to make the traverses. At the left is the instrument which picks up the analyzes the variations in radio signals which, properly interpreted, signify changes in the subsurface stratigraphy. Below is the recording portion of the device, on which is plotted the variation either way from normal signal strength. A fault indication has been checked in pencil to call attention to the marked change in record characteristics as subterranean conditions affect radio reception.



across bridges, through underpasses, under wires, through deep cuts, etc. Most experimenters have called these effects obvious cases of shielding.

Very little work has been published on the problem of the origin of variations in the intensities of radio broadcast fields. The data that have been published have in some cases been misleading since they have failed properly to interpret the observed phenomena. We need not go into the theoretical arguments concerning the recorded variations in intensity, as we can correlate these with the known conditions that can be seen above ground which are noted on the record as it is made. It follows that any recorded changes in intensity that are not accounted for by cuts, wires, bridges, or other conductors above ground must of necessity be the result of subsurface anomalies.

In practicing the Blackburn radiographic method, the intensities of standard broadcast stations have been measured over known faults, anticlines, synclines, and salt domes in order to determine the effect of sub-surface anomalies on the areal variation of the intensities. The tests were made with a special, sensitive radio receiver connected to an Esterline-Angus recording meter; the apparatus was mounted in a two-door sedan automobile. The recording meter was driven by a speedometer shaft and so geared that it turned out a continuous intensity record of two and one-half inches for each mile of traverse.

Hundreds of traverses over known geologic structures have yielded the following results:

1. The continuous record over any traverse, regardless of its length, will substantially duplicate itself on repeat runs.

2. The records show both gradual and sudden changes in intensity, "weak spots," and "strong spots" as some call them.

Where these sub-surface anomalies, that is, faults, anticlines, synclines, etc., were known by previous drilling, it was possible to correlate radiographic anomalies with them. It was found that all variations of intensity of the radio broadcast fields could be accounted for by secondary fields interfering with the primary field, by reflection and refraction of the primary field, and by considerations of the action of the law of the critical angle on a field after it once enters any sub-surface strata. In every case where a known fault was tested, it was found to have a greater or smaller effect on the broadcast field depending on the amount of conducting material in the fault plane. Although the recorded effects were not identical, they could be recognized as fault effects by the fact that they occurred over the surface trace of known faults. Where the same fault was crossed at four or five different places, a line drawn through these anomalies gave the position and direction of the fault.

An anticline, syncline, or a nose on a fault is easily determined by the gradual increase and decrease of the field inten-

If You've Heard It Whispered That American Manufacturing Co. of Texas Is Quitting the Supply Business,

GIVE US YOUR NEXT ORDER* AND SEE HOW FAST YOU GET DELIVERY!

***For Pumping Units, Rod Line Equipment, Jacks, and Almost Any Item of Surface Equipment**

★

During the war we were so busy producing *millions of shells for the Army and Navy* that some folks were saying, "maybe American will never go back into full production on oil field items."

This idea is WRONG, and we want to set the record straight. American has never *quit* making Pumping Units. We made them all through the war years, and expect to be making them for many years yet. Since the war the American Pumping Unit line has been completely redesigned and improved. Production is being stepped up, and today you can get what you want . . . and get it *fast*, when you order from American. Ask our customers or try us and see for yourself.

Swaged Nipples
Pumping Jacks · Casing Nipples
Tubing Nipples · Braden Heads

American Manufacturing Co. of Texas

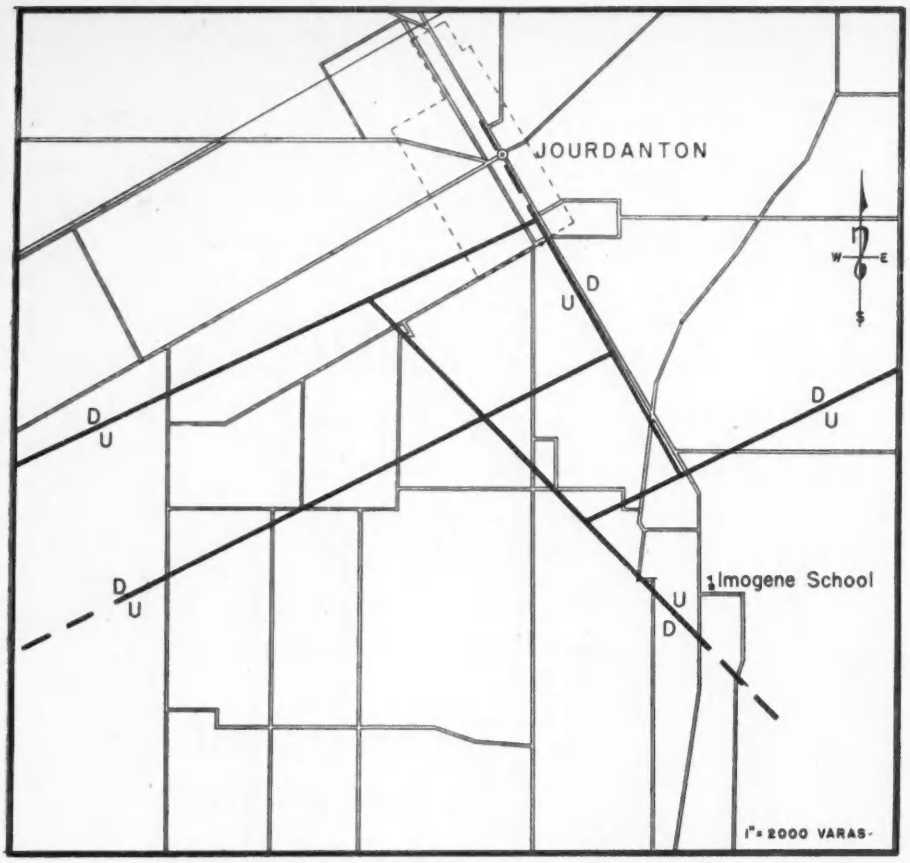
FORT WORTH 1, TEXAS
Phone 6-5401

KILGORE
Phone 138

ODESSA
Phone 666

Unit Pumpers · Crown Blocks
Turnbuckles · Bull Plugs
Swings

Since 1924



Network of intersecting faults as determined by a series of radiographic surveys along traversable roads in the area. The survey not only determines the trend of the faults, but clearly indicates the up- and down-throws of the individual faults, enabling the spotting of wells on a favorable prospect.

sity on the continuous record as the recording receiver passes over such geologic structures.

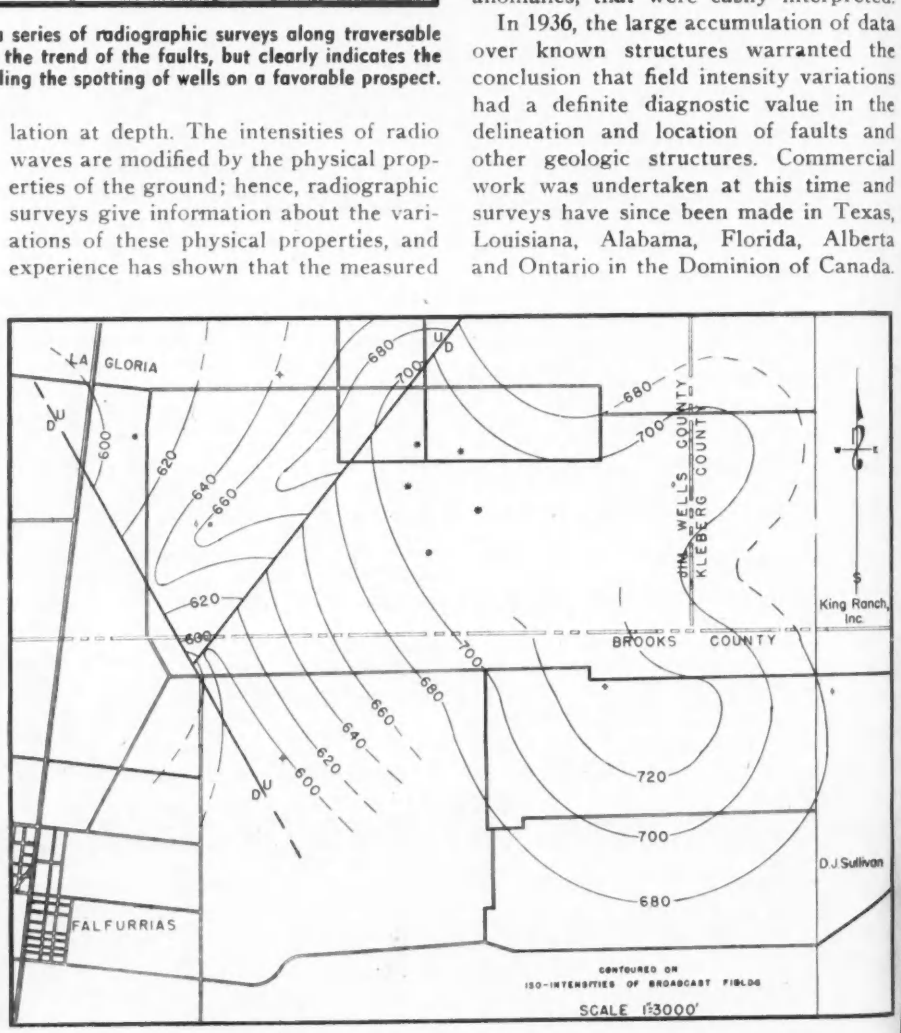
The objection may be raised to the radiographic method that theory denies to the waves any appreciable (in terms of wells 15,000 feet deep) depth penetration. The subject is very difficult and experimental determinations of depth penetration cannot be made in deep holes on account of the conducting wires which must be lowered to the measuring instrument. They pick up electromagnetic energy and thus vitiate the results. However, great depth penetration may not be necessary in explorations for oil or gas. It is known that the near-surface sediments overlying oil fields possess measurably different physical and chemical properties than the stratigraphically equivalent sediments which lie off and away from the producing areas. Seismic velocities are higher, thermal and electrical conductivities are higher. Geologists have long ago found differences in the color of plants growing on and off oil fields, and sometimes the difference even extends to a change in species; that it is has been noted that certain plants will, and others will not, grow on some oil fields.

The radiographic method takes advantage of the enviromental changes in the sediments which have been gradually brought about by an oil or gas accumulation at depth. The intensities of radio waves are modified by the physical properties of the ground; hence, radiographic surveys give information about the variations of these physical properties, and experience has shown that the measured anomalies can be correlated with geologic structure and with the production of oil and gas. The results are not always sufficiently determinative for commercial purposes; for this reason, it is suggested that the seismic method be used to secure depth information where the radiographic results lack clarity. We may say, in resume, that radio waves either penetrate to greater depths than theory gives or the anomalies which are determined are caused by differences in physical properties brought about by the presence of oil or gas at depth, or by structure, or by a combination of both.

Used in 1932

Experimentation on the Blackburn radiographic method of geophysical exploration was started in 1932 over known geologic structures in Texas. As the intensity effects became better known by comparison, with known conditions, the equipment was improved until finally continuous recording on traverses took the place of individual locations spaced from 100 to 200 feet apart. It was then found that these permanent continuous records not only duplicated themselves over the same traverse but also gave added information as to sub-surface anomalies, that were easily interpreted.

In 1936, the large accumulation of data over known structures warranted the conclusion that field intensity variations had a definite diagnostic value in the delineation and location of faults and other geologic structures. Commercial work was undertaken at this time and surveys have since been made in Texas, Louisiana, Alabama, Florida, Alberta and Ontario in the Dominion of Canada.



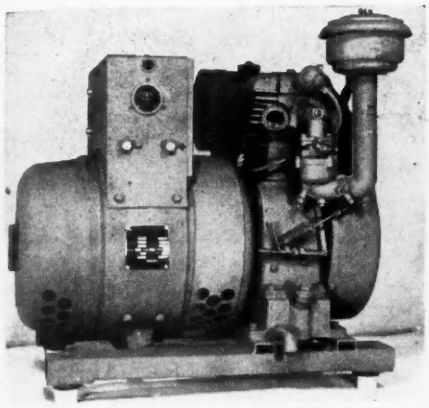
Contours on iso-intensities of broadcast fields as developed for area northeast of Falfurrias, with location of two faults. Survey was conducted on the network of intersecting roads shown on the map.

NEW EQUIPMENT LITERATURE

FOR ADDITIONAL INFORMATION, USE MAILING CARD INSERTED OPPOSITE THIS PAGE

1—AC Generator

A Katolight plant with a capacity of 2500 watts AC is self-excited and cranks from a 24-volt battery. The DC winding has sufficient capacity to charge a standard 32-volt glass jar-type battery. In



reality, it is a combination AC-DC unit. This generating plant is complete with battery-charging relays, and the charging rate automatically adjusts itself according to the AC load.

The unit may be furnished with full automatic control or remote control. A voltage regulator holds the AC voltage within five volts change between no load and full load.

The generator is mounted directly on the side of a Briggs & Stratton ZZP single cylinder, 1800 revolutions per minute engine. The engine generator unit is mounted on a welded steel base equipped with rubber vibration absorbers. It is available with gravity feed gasoline tank or fuel pump to permit drawing fuel from underground supply tank. Length, 28 inches; width, 20 inches; height 26 inches; net weight, 380 pounds. At full load, gasoline consumption is 2¼ hours per gallon.

Kato Engineering Company, Mankato, Minn.

(Check item 1 on postcard for more information.)

2—Reverse Flushing

The Radi-Flush was especially designed for reverse flushing of automobile truck, tractor and airplane radiators and blocks, using steam and

chemicals for accomplishing a thorough cleaning and reconditioning of such cooling systems. The White Radi-Flush, equipped with the proper type of connectors, can be used, the manufacturer states, for nay cleaning purpose which requires flushing. The maker states that a hot chemically treated solution will dissolve the cooked-on rust and dirt found in partially or completely clogged, slow circulating radiators and motor blocks.

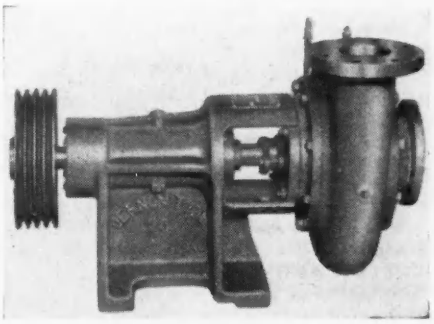
It is stated that the White Radi-Flush can be used in conjunction with a White, or similar type vapor steam cleaning machine. This system of flushing employs the steam generated by the vapor steam cleaner, in which the cleaning compound is mixed. The solution of steam and chemicals is reverse flushed under controlled pressure until the entire cooling system is completely clear.

White Engineering & Manufacturing Company, Inc., 146 W. Passaic Street, Rochelle Park, N. J.

(Check item 2 on postcard for more information.)

3—Centrifugal Mud Pump

A centrifugal pump built specifically for handling rotary drilling mud and other particularly abrasive fluids incorporates numerous features designed to withstand wear caused by sand, rocks,



shale and other solids commonly present in oil field operations.

The Vernon Centrifugal Pump was originally intended solely for use with the Vernon-Corwin Rotary Mud Desander. Its outstanding performance, however, has disclosed other oil field applications including mud transfer and mud loading, sump and pit cleanout work, and as a booster pump for the regular rig mud pumps. It is a heavy-duty, slow speed centrifugal pump and is adaptable to either V-belt or direct drive.

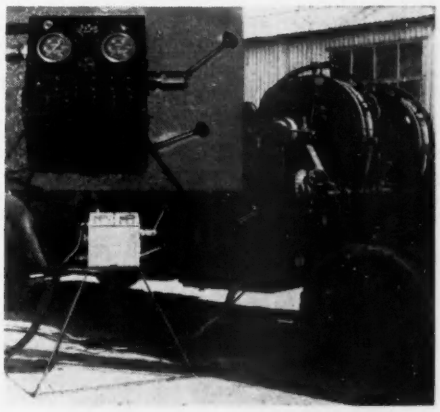
Vernon Tool Company, Ltd., 1101 Meridian Avenue, Alhambra, Calif.

(Check item 3 on postcard for more information.)

4—Remote Control Box

Designed in cooperation with Phillips Petroleum Company is the new movable master remote control box for use with the Franks line of drilling and servicing equipment. Movable to practically any position or location desired by the operator within a radius of 40 feet, this method of control eliminates "blind spots" in the control of servicing units and drilling rigs.

The complete system of air-actuated controllers allows the ease of true fingertip touch, with a full range of adjustment and speeds. It permits operation



and control of the winch unit, motor, clutches and brakes at a distance away from the well head.

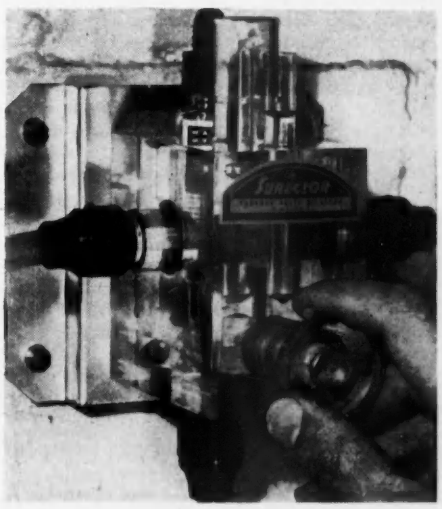
Franks Manufacturing Corporation, Whittier Station, Box 3218, Tulsa.

(Check item 4 on postcard for more information.)

5—Water Purifier

Exploration operations, both geophysical and drilling, in remote areas in this country as well as in foreign lands sometimes require that the operator purify drinking water for crewmen. Illustrated is a water chlorinator no larger than a man's hand which will add the proper amount of purifying agent by merely turning a knob. This little water-purifier, called "Sureclor," is the result of many months of experimentation in the field of water chlorination.

The chlorination unit is made of clear plastic, has no moving parts, and re-



quires no auxiliary pumps or motors. It operates by water pressure and the makers say it can be installed easily and quickly on any type of pressure water system. Sureclor directs the right amount of chlorine solution into the water stream, clearing it of any harmful bacteria often present in springs, wells or surface water.

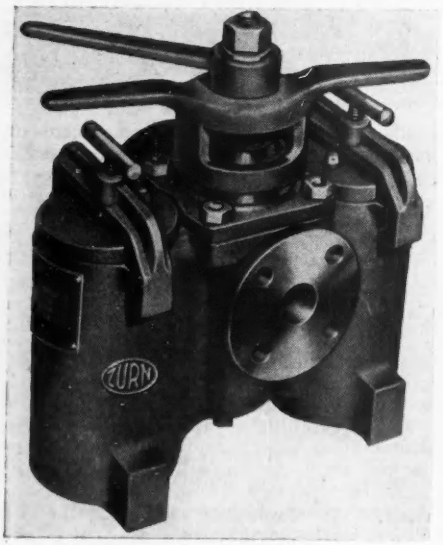
The Sureclor unit has a water-testing set built into the face of the unit which can be used at any time to determine when the drinking water is getting the right amount of purifying chlorine.

Paddock Engineering Company, 900 S. Ervay, Dallas.

(Check item 5 on postcard for more information.)

6—Duplex Strainer

A new type duplex or twin sediment strainer has been developed to meet the demand for an economical strainer in pipe lines where continuous flow is imperative. When the strainer is to be



cleaned, flow can be diverted from one basket to the other without interrupting passage through the strainer.

The unit operates by means of a single plug-type valve whose vents direct flow from the inlet to either basket, or both simultaneously. The seating of the plug into the body is regulated by the relieving yoke which acts to seat the plug tightly for sealing, or to loosen it for turning, as required. Plug action is positively non-freezing—is said to operate freely and easily at all times.

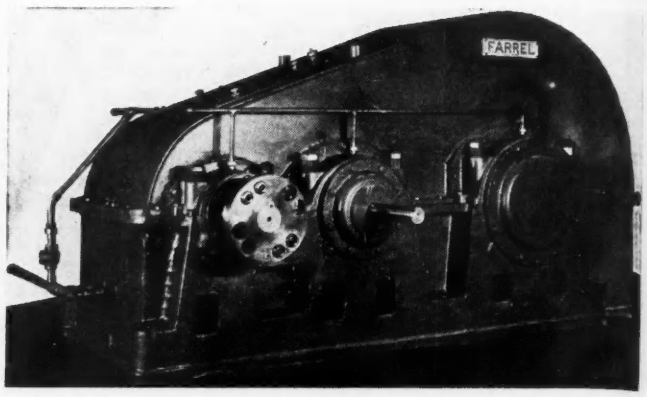
Dual air relief valves are regularly furnished, available with flanged or screwed connections, and suitable for working pressures from 125 to 300 pounds. A basket chamber cover yoke assembly, or C-washer type bolted cover assembly is furnished as required. Both types are quick releasing. Made in bronze, steel, semi-steel, or special alloys to specifications. Sizes one to six inches regularly; larger sizes to order.

J. A. Zurn Manfacturing Company, Erie, Penn.

(Check item 6 on postcard for more information.)

7—Double Set-Up Speed Increaser

For higher ratios than are desirable in single gear units, double stepup speed increasing units of the type shown have been developed. This particular unit is designed to transmit 1300 horsepower from a 240 revolution-per-minute engine to a pump operating at 3150 rpm.



The double helical gears and pinions are precision generated, and are made of materials selected for strength and toughness to provide long life in continuous pipe line service. Oversized shafts, ground to close tolerances and mounted in precision sleeve bearings for the high-speed shaft and in anti-friction bearings for the intermediate and low-speed shafts, provide the necessary rigidity to guard against torsional deflections under peak torque variations. The intermediate shaft has an extension to drive auxiliary equipment such as a water pump or generator. A self-contained circulating oil system provides separate lubrication to all gears and pressure lubrication to all bearings. A heavy cast double-walled base with welded steel cover provides a rigid housing and assures permanent alignment of all elements.

Speed increasing units of the double stepup type are made with ratios ranging from 12:1 to 40:1. Single stepup units are available in 47 standard sizes with speed ratios ranging from 1¼:1 to 12:1.

Farrel-Birmingham Company, Inc. Ansonia, Conn.

(Check item 7 on postcard for more information.)

8—Acidizing Unit

A new idea in oil well acidizing equipment consists of a trailer-mounted unit containing its own independent power source. Outstanding features include the use of magnesium which has reduced the overall weight by more than 2000 pounds.

The E-type pump on the unit can pump as high as 6000 pounds pressure and the F-type pump, which sometimes is used on the unit, can pump as much as 8000 pounds. Pressure and gallonage rate of these pumps are regulated by the head and piston sizes.

Pumps are designed by the manufacturer of the unit, have cast steel heat-treated cylinders, and are driven by two 451-cubic inch displacement, 130-horsepower motors with compound chain drive. The unit carries sufficient gasoline to pump continuously for a whole day.

Mounted on the end of the unit is a 1000-gallon acid tank made of high corrosion resistant steel, and the complete unit with tractor has 18 tires on the ground.

Engine exhaust mufflers are of the safety type, and the unit is equipped with several fire extinguishers of the CO_2-type. A large first aid kit is conveniently placed on each unit, which carries all standard equipment. For safe night operation, the unit is completely lighted and all moving parts are protected by steel guards.

The new unit doubles the high-pressure injecting rate of chemicals over the standard type acidizing unit previously employed for this purpose. The two 130 horsepower motors are necessary in order to provide sufficient power to operate the pumps.

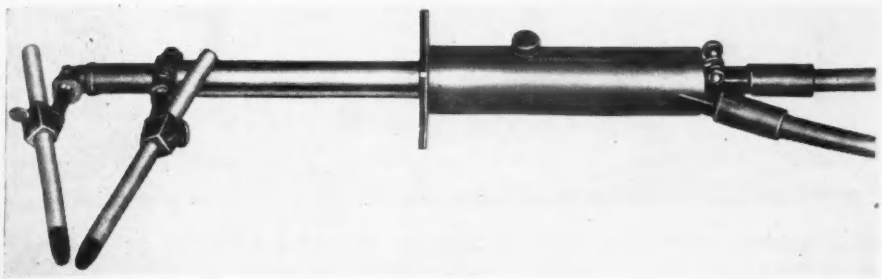
Dowell Incorporated, Kennedy, Building, Tulsa 3.

(Check item 8 on postcard for more information.)

9—Arc Torch

Many welding and brazing operations for which a very soft flame is the most suitable source of heat can now be done by the double-carbon arc process. The new torch is said to make every arc welding machine available for practically every welding, brazing or heating job.

Current conducting members of the Phillips Arc Torch are two concentric metal tubes, one sliding easily within the other and insulated by a fiber sleeve



thus automatically maintaining alignment for all adjustments of arc gap width. A control button is located in the fiber handle so that it is directly below the thumb when the torch is held naturally in the hand. The torch can be used with all types of arc-welding machines, AC or DC, and is furnished with both bayonet- and lug-type terminal connectors. It will accommodate carbon electrodes from ¼- to ⅜-inch diameter without changing holders or using adaptors.

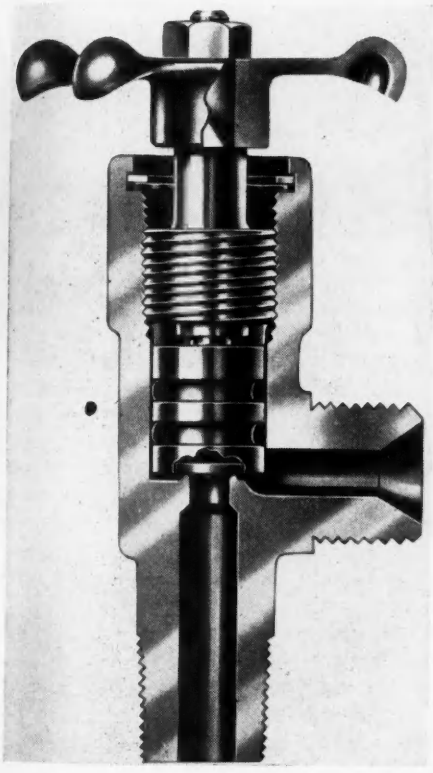
Rate of heating of the work is controlled by holding the arc close to the work or drawing it away slightly. The arc gap can be held at constant length by a light pressure on the control button, as the carbons are consumed. This ease of control makes the arc torch suitable for brazing thin sheet metal, including aluminum, for many types of brazing and non-ferrous metal welding, for numerous hard facing applications, and also for preheating, spot hardening and spot annealing.

C. E. Phillips & Company, Inc., 2750 Poplar Street, Detroit 8.

(Check item 9 on postcard for more information.)

10—High-Pressure Valve

An entirely new design in valves, the Se-Co packless stem valve is claimed to resist freezing in either the open or closed position when used on high-pressure gas systems. It is impossible to dis-



assemble this valve by turning the spindle past the open position. The combination of these two outstanding safety features eliminates the hazardous possibility of an individual accidentally backing the spindle out of a valve in service on a cylinder or line containing gas at high pressure. It is listed by the Underwriter's Laboratories, Inc.

A brass retaining washer, held in place by a Waldes snap ring, stops upward motion of the spindle at the wide-open position. Since the retaining washer is free to rotate, there is no possibility of the spindle becoming wedged in the open position. In the closed position, downward motion of the spindle is halted both by the valve's Neoprene seat and a metal-to-metal contact. Again, no freezing is possible, owing to the inherent resiliency of Neoprene. Gas pressure is ingeniously utilized to increase seal effectiveness. Increasing pressure against the exposed portion of the Neoprene seat is translated into increasingly firm contact at the actual sealing points.

Equipped with Neoprene "O" rings, as well as a Neoprene seat, the Se-Co valve also has a heavy-duty forged brass body and a full-grip hand wheel. Approved operating pressures are one ounce to 3500 pounds per square inch. Operating temperatures are 70° F. and 250° F. Maximum open and close torque is 35-inch pounds.

Security Valve Company, 410 San Fernando Road, Los Angeles 13.

(Check item 10 on postcard for more information.)

Literature

11—Chain Catalog

Sixteen pages comprise catalog 708-B, "Chains and Sprocket Rims for Oil Well Service." Generously illustrated, the catalog shows some of the steps in the manufacture of offset chain. Nine types of oil field chains are described and illustrated in addition to specifications on each type. Features of construction are presented on various API chains with the aid of individual parts photographs. Offset chains in double and triple construction are described and specified. Dimension charts are used to show accurately the detailed dimensions of all parts of the chain elements. Replacement rims for chain sprockets are described and illustrated. Specifications and dimensions are presented for three chain sizes.

The Jeffrey Manufacturing Company, Columbus 16, Ohio.

(Check item 11 on postcard for more information.)

12—Cementrol Bulletin

"Cementrol" is the title of a two-color, 12-page brochure containing detailed information on Larkin Cementrol equipment. Principles of operation and basis of development are discussed and illustrated with isometric illustrations. Five interesting applications of the Cementrol equipment are graphically shown and described. Feature articles which have appeared in the trade journals have been reprinted in this publication to add to the information. Both isometric and cross-sectional drawings are used to illustrate these articles.

Larkin Packer Company, 6200 Maple Avenue, St. Louis, Mo.

(Check item 12 on postcard for more information.)

13—Steel Spudders

Bulletin S-10-47 is an eight-page compilation of photographs, sketches, recommendations for associated equipment, and specifications on the Ideco Model 10 steel spudder for water, oil and gas wells. Features of the spudder are discussed and illustrated. Capacities for the unit when used for depths ranging up to 500 feet are listed for ¾ and ⅝-inch wire rope. Equipment recommended includes drilling tool outfits, blacksmith outfit No. 10-E, casing tool outfits, and standard fishing tool outfit.

International Derrick and Equipment Company, Marietta, Ohio.

(Check item 13 on postcard for more information.)

14—Slush Pumps

Blueprints, performance charts, complete specifications, and eight photographs are contained in Bulletin 326 describing the Ideal steam slush pump Type S-935. This large duplex steam slush pump has been designed for ruggedness and durability. Both the fluid and steam ends are of all-steel construction for maximum strength with minimum weight. The patented "GT" piston and rod design gives a positive seal without excessive stress.

The National Supply Company, Box 899 A Toledo 1, Ohio.

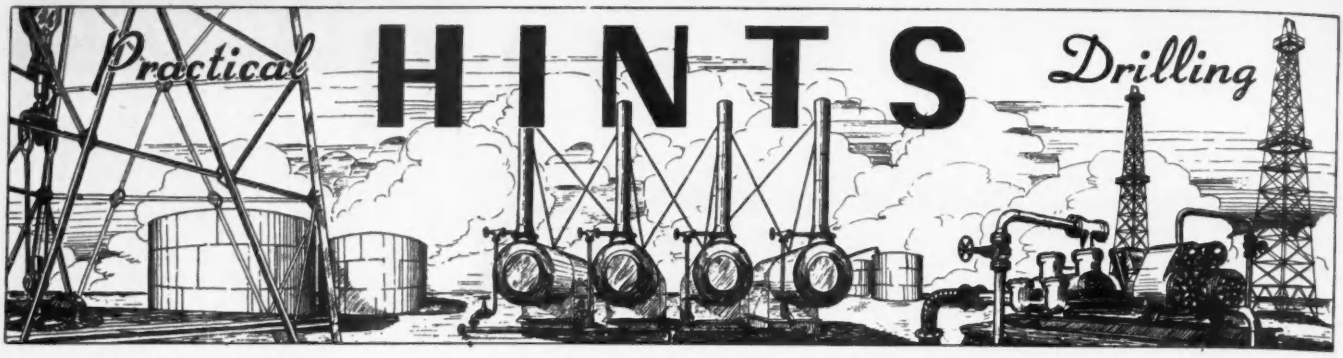
(Check item 14 on postcard for more information.)

15—Engineering Tables

"Engineering Data and Reference Tables" is the title of a 12-page bulletin, No. 467, which is said to be an invaluable aid to the engineer in laying out piping and associated equipment. This collection of information is a compendium of handy data for calculations of piping, pumps, heaters, traps, reducing valves, temperature regulators, pump governors, pressure controllers and other such equipment.

Leslie Company, 167 Delafield Avenue, Lyndhurst, N. J.

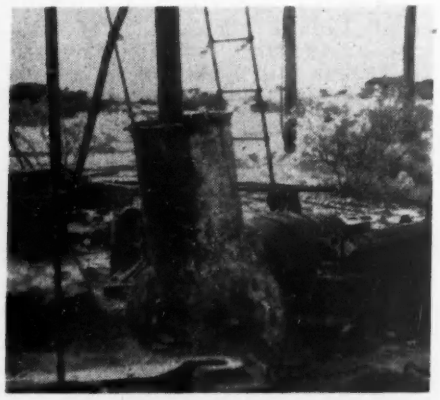
(Check item 15 on postcard for more information.)



$10.00 is paid for each illustrated acceptable contribution. Mail to The Editor, WORLD OIL, P. O. Box 2608, Houston 1, Texas

How To—

Handle Well Cuttings with Bailer Dump Box



CABLE TOOLS

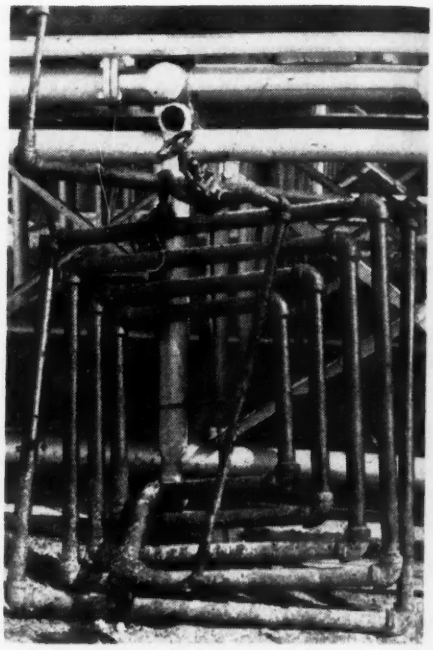
Well cuttings bailed from the hole when standard drilling rigs are employed may be disposed of by several different methods. One of the old methods was to push the bailer to the side of the derrick floor and allow the bailer to dump itself on the ground. Other methods for handling the well cuttings on these standard rigs usually require that special equipment be constructed into the rig either below or on the derrick floor.

Illustrated is a relatively simple and inexpensive method devised and employed by one drilling company for handling cuttings taken from the bailer. It serves two primary functions. One: the cuttings dumped from the bailer are carried from the derrick floor to the shale pit located below the floor on the ground; two: little effort is required of the drilling crew to push the bailer full of cuttings into position for dumping into the dump box.

The unit described above was fabricated from salvaged 14-inch casing which had been welded into a long ell as shown. The short end extends approximately 30 inches above the floor and was belled slightly at the top lip. The other ends extends off the floor and discharges into the shale pit. This section varies in length depending on the set up. At the right-angle bend, a solid steel rod was welded across the bottom of the unit to form an axle for two iron wheels. The application of wheels to the dump box made it possible to move the box about the derrick floor with little trouble, and thus eliminated the installation of other more elaborate methods of disposing of cuttings. The vertical run of the box is long enough to prevent fluid from splashing on the floor while the bailer is flushed into the box. When not in use, the bailer dump box may be moved.

How To—

Heat Drilling Muds

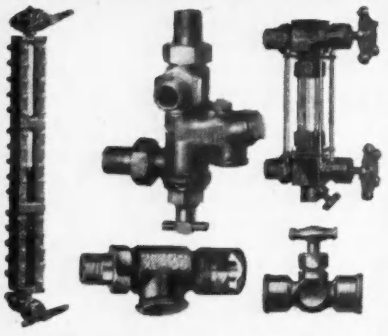


MUD CONTROL

Heating special mixes of drilling mud when the need is urgent and little time is available for rigging special steam coils for a particular tank, may be done simply and easily with the aid of a portable coil which can be lowered into practically any size tank in the circulating system. The coil is made up of a series of two-inch pipe nipples and elbows and is connected together to form a series of squares which progressively reduce in size toward the center as shown in the installation which had just been removed from a tank. A riser of one-inch pipe, with a valve on the upper end, projects upward to where it is accessible from the top of the tank.

This type of coil is made of standard pipe fittings, is 100 percent salvageable, is easy to handle and carry from one job to another and is compactly assembled.

PENBERTHY
QUALITY
PRODUCTS



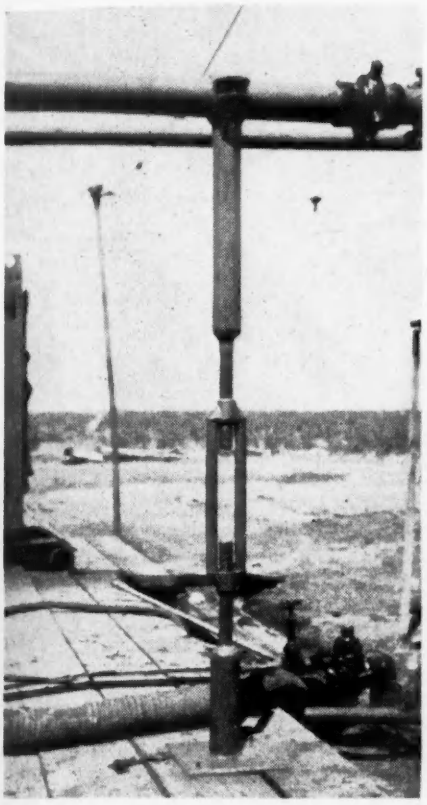
Penberthy liquid level gages of various types—injectors—ejectors—all so widely used throughout the oil industry because they have always been dependable under the most severe service conditions.

All are of rugged construction and made by an organization with 57 years experience in the manufacture of quality products.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

How To—

Support Overhead Piping



PIPE SUPPORTS

Overhead piping has been found convenient and efficient on some drilling rig setups. Not only do such methods of connecting up pipe reduce the number of fittings required, but the job of setting up and tearing down the rig become simplified. One drilling contractor employed the method illustrated to support long runs of heavy overhead lines which carried pressure.

The support shown not only provides the necessary support to steady the line, but is also adjustable for many heights. It was made up in the shop by a welder from inexpensive parts. It consists of two nipples of 2½-inch pipe and a 1⅛ by 24-inch turnbuckle. A 12-inch square base plate was welded to one short nipple of 2½-inch pipe to which was welded the threaded shank of the turnbuckle. One end of the longer nipple was welded to the other threaded shank of the turnbuckle while the upper end was welded to a shop-made pipe clamp.

The base of the support is nailed to the wooden platform and the overhead pipe placed in the pipe clamp. Thus secured in place, the height of the support may be adjusted to any desired level within the limits of the turnbuckle. Several of such rupright supports greatly simplify the job of setting up the rig as well as reducing the tearing down time. They have also been found to provide a firm anchor for pulsating lines.

How To—

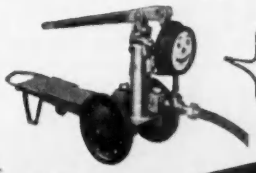
Install Rack for Mud Pump Repair Parts

PUMP PARTS

Selection and handling of pump rubbers, gaskets and packing may be facilitated by installing a handy rack which is removable and can be hung on the side of a mud settling tank or small building located near the slush pumps. The rack, made of steel rod and built up with three rows of projecting pins slanting slightly upward, accommodates practically every size and type of gasket, packing nuts, etc., which might be needed on the job. In addition to the benefits realized by the rack being removable and easily carried when tearing down or rigging up, the installation easily may return its original cost every time emergency repairs must be made on the pump by reducing down time of the equipment. Quick inventory of remaining parts and supplies also is possible with this easily accessible rack.

They call me "HANDY ANDY"

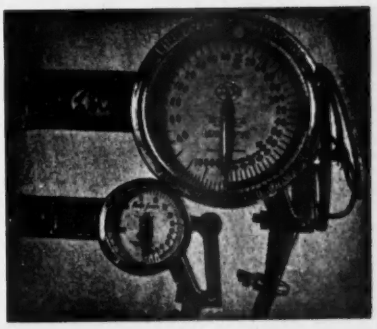
I can test pipe and fittings, remove cores, and develop pressures up to 6,000 psi for any and all types of testing. I weigh approximately 68 lbs. on a solid base, but if you don't want to lug me around, then order me with wheels.



BAKER *hydraulic* HAND PUMP

ASK THE *BAKER* MAN

LINE SCALES



20 MODELS to choose from

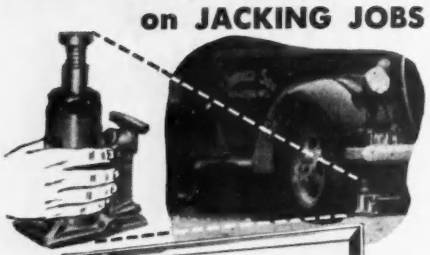
(Above) Super 500,000# capacity, 14" dial. (Below) Packer Special, Capacity 40,000#, 6" dial. 18 other models for every drilling, well servicing or work-over need.

With a Line Scale you know the pull on the line, and the weight on the bit in pounds. Accurate, sensitive, rugged and economical.

Line Scales are dependable, even in areas of rapid temperature changes. Repeated tests prove the accuracy of Line Scale readings under all working conditions.

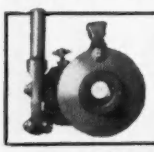
LINE SCALE CO., Inc.
Phone 6-1765, 907-11 SE 29th St., Box 4245
Oklahoma City, Oklahoma

TO SAVE HOURS and $$$ on JACKING JOBS



Put **SIMPLEX** *in the picture*

Avoid costly delay on transport breakdowns by specifying Simplex Industrial Hydraulic Jacks as musts on all mobile equipment. The complete Simplex line includes a Hydraulic Jack to meet every need in the petroleum field — with each model safety tested to 50% over capacity, plus exclusive Simplex features to give you easy operation, speed and "jack-ability" that means hours and dollars saved on tough jobs. Available in 3, 5, 8, 12, 20, 30, 50 and 100-ton capacities.



SIMPLEX-JENNY CENTER HOLE HYDRAULIC PULLER

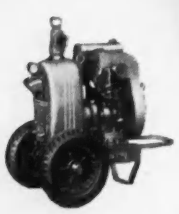
Patented center hole principle plus hydraulic action cuts hours off such jobs as pulling wheels, pistons, valve seats, gears, etc. 30, 50, 80 and 100-ton capacities.

TRY ONE FREE!

Let a Simplex Hydraulic Jack or Simplex-Jenny prove itself in action. Ask for a 30-days Free Trial, without obligation. Specify model desired: send request on your letterhead to:

TEMPLETON, KENLY & CO.
1032 Central Avenue, Chicago 44, Illinois

Sterling
PUMPS • HOISTS • LIGHT PLANTS



DEPENDABLE
RUGGED
SIMPLE
•
SAVE
MONEY
SAVE
TIME

STERLING QUALITY

For more detailed information see pages 3620 and 3621, Composite Catalog.

STERLING
MACHINERY CORPORATION
405-13 SOUTHWEST BLVD. KANSAS CITY 10, MO.

TRADING POST

Ahead

Page 72

How To—

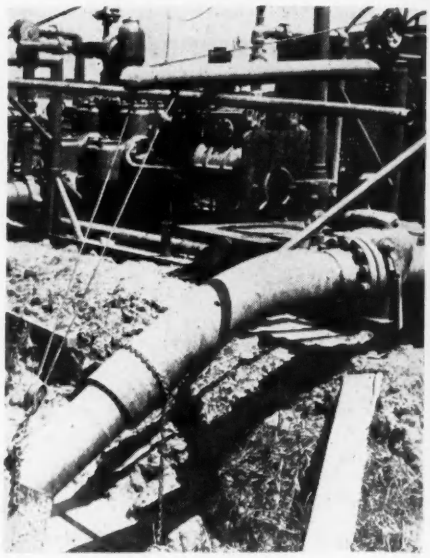
Fabricate Efficient Mud Pump Suction Support

Lowering or elevating the mud pump suction lines as the mud level in the sump pit varies requires special consideration when setting up the rig. Due to their size and weight, some means must be provided to handle this job. An efficient and relatively simple means of supporting the suction lines was designed by one company in an attempt to unify the mud pump battery.

SUCTION LINES

A suction lift as shown was incorporated on each mud pump skid and became a part of that unit. The support consists of an "L" fabricated from four-inch pipe with a 45 degree angle brace at the right angle juncture. The upright section of the "L" is approximately four feet high, while the horizontal run is six feet. The end of the horizontal run was orange peeled after a small steel pulley had been welded into the pipe.

The winch of the unit was made from a worm gear assembly welded to the top of the horizontal run. An extension on the worm gear placed the hand wheel within easy reach of crewmen making adjustments of the suction line. Half-inch wire line was wound up on the spool welded to the bevel gear. The line was then threaded through the pulley on the end of the support, down through the pulley attached to the large diameter suction pipe, and back up to an eye secured to the horizontal supporting arm. The support is inserted into a five-inch nipple which has been welded and braced in an upright position to form the base of the support. This base is fixed permanently to the mud pump skid. The leverage provided by such a system makes it unnecessary to use any braking device. Upon dismantling, it is necessary only to unhook the pulley from the suction line and take the support out of its base on the skid.

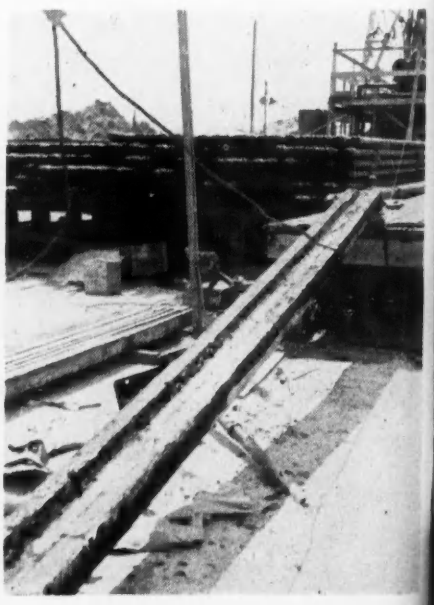


How To—

Speed Laying Down Drill Pipe

In order to facilitate the laying down and racking of a string of drill pipe, and at the same time be assured that threads or collars will not be injured during the operation, one company has developed a method which employs a skid plank down which the pipe can travel before reaching the horizontal and subsequent rolling off on to the rack or truck bed. The long plank, actually a single 3x12 plank atop which has been spiked two narrow sections to form a central groove as shown, is smeared with grease or any lubricant which will aid in lowering the pipe. The distant end of the plank, as pictured, is placed on the edge of the derrick floor with the plank sloping downward to the walk. The derrick high-line and trolley hook are employed in conventional fashion, the hook being released as soon as the pipe reaches the point where it is rolled off. The skid plank saves much time which is quite often spent in prying and otherwise working the pipe.

PIPE HANDLING



Do you need
WELL HEAD EQUIPMENT OR
GAS LIFT INSTALLATIONS?

Then look first in the

McEvoy section

OF YOUR COMPOSITE CATALOG

McEVOY COMPANY
COMPLETE CASING NEST ASSEMBLIES
(Continued)
Order by Type, giving casing sizes, pressure for each head and number and size of outlets for each head
McEvoy
ASSEMBLIES
It's easy to order casing nest assemblies this way:
If the assembly you want is not shown here, you
52 PAGES . . . . PAGE 2353 THROUGH 2404

Crude Production Near Record Level; Refinery Output Hits All-Time High

The industry carried on operations at exceptionally high levels during the week ended August 2, the API reported. While crude was produced at a near-record level, runs to refinery stills were boosted to a new all-time peak of more than 5,250,000 barrels a day. This increased refinery activity reflected favorably on principal refined products' inventories as burning oil stocks continued to build at satisfactory rates and gasoline in storage was kept at almost the same level of a week earlier.

Daily average crude production amounted to 5,088,000 barrels in the week ending August 2, an increase of 4000 barrels a day over the previous week's rate. A year ago output was 207,000 barrels a day or 4.2 percent less than this average. This was the third successive week that production had increased and it is again nearing the all-time record of 5,115,000 barrels a day.

Runs to refinery stills were increased 109,000 barrels a day over the previous period's to average 5,271,000 barrels and set a new record. The previous peak had been 5,229,000 barrels a day in the week of July 12. To reach this new level the nation's refineries operated at 93.3 percent of total capacity. In last year's like week runs to stills were 435,000 barrels daily or 9 percent lower.

Stocks of refinable crude totaled 231,357,000 barrels on July 26, the latest Bureau of Mines report showed. This indicated a drop of 495,000 barrels during that week, but also showed that stocks were 7,601,000 barrels or 3.4 percent higher than a year before.

Gasoline production, including natural blended at the refinery, amounted to 16,517,000 barrels in the week to show an increase of 375,000 barrels over that produced a week before, and 1,361,000 barrels or 9 percent more than last year's period. Stocks of finished and unfinished gasoline totaled 85,645,000 barrels at the week's end, a decrease of only 167,000 barrels in the seven days. Since the beginning of the summer motoring season stock withdrawals have totaled well over a million barrels per week and the week's ease-up improved the gasoline inventory position considerably.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
High:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,036	11- 2
1947	[1]5,115	6-21	[1]5,271	8- 2	239,370	5-31	107,576	3-29	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	10- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,198	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	4-11	4,667	4-12	220,313	2- 8	85,645	8- 2	31,470	4-19	42,668	4-26

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,494
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 29	4,865	4,843	227,529	14,396	107,576	5,969	32,737	8,668	43,364
April 26	4,930	4,725	235,383	14,213	103,860	5,435	32,286	8,186	42,668
May 31	5,024	5,000	239,370	14,709	95,876	5,732	36,032	8,910	45,224
June 28	5,109	5,093	236,221	16,070	91,806	5,906	41,721	8,298	48,490
July 5	5,065	5,109	233,810	15,759	89,674	5,659	43,900	8,485	49,151
July 12	5,045	5,229	232,361	16,197	88,791	5,909	45,261	8,679	50,529
July 19	5,050	5,126	231,852	15,747	87,145	5,912	46,505	8,969	51,317
July 26	5,084	5,162	231,357	16,142	85,812	5,708	47,097	8,738	52,497
August 2, 1947	5,088	[1]5,271	.....	16,517	85,645	6,004	48,329	8,582	53,107
August 3, 1946	4,881	4,836	[3]223,756	15,156	87,217	5,514	46,797	8,120	50,561
Change:									
In Week	+4	+109	—495	+375	—167	+296	+1,232	—156	+610
In Year	+207	+435	+7,601	+1,361	—1,572	+490	+1,532	+462	+2,546
In Year	+4.2%	+9.0%	+3.4%	+9.0%	—1.8%	+8.9%	+3.3%	+5.7%	+5.0%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, July 27, 1946.

Bonuses and Revised Prices Pull in East Texas Crude

Ten percent of the daily production of the East Texas field is currently sold to buyers paying a cash bonus, else at revised price postings that exceed the flat price of $1.95 per barrel paid by all majors. The extra bounty, ranging up to 15 cents per barrel, is resulting in a substantial shift in well connections each week.

Dale W. Moore, Houston broker specializing in export crude sales to England and Canada, has contracted for approximately 10,000 barrels daily at 15 cents premium. These contracts generally involve an 18-months period. Crown Central Petroleum Corporation, owner of a refinery near Houston, has stepped up its purchases in the field to about 12,800 barrels daily through the payment of a smaller premium. Premium Oil Refining Company of Texas, a local refiner, and the Central Pipe Line Company, a unit of the Allied Oil Company, have adopted a price posting of $2.05 per barrel, or 10 cents above that paid by majors.

Sun Oil Company advised its industrial customers of a 21 cents per barrel advance in prices for heavy fuel oil on the Atlantic seaboard, effective July 31. At the same time Sun announced an increse of .3 to .5 cent per gallon for furnace oils, kerosine and industrial distillates in Maryland and New Jersey.

Effective August 4, were increases made by Standard Oil Company of Kentucky in its tank car prices at major southern ports, which amounted to .2 cent for gasoline, .3 cent for kerosine, and .4 cent for diesel fuel.

No let up in heavy demand for products at the Gulf Coast was indicated in trade reports. Suppliers reported buyers were offering "fantastic" prices in efforts to loosen supplies. Some purchasers were becoming discouraged at the Gulf and going to California in search of materials.

At New York harbor, buyers were said to be offering "premium" prices in an effort to pry loose closely held material, and some harbor suppliers reported receiving offers as high as 12.5 cents for regular-grade gasoline and 8 cents for No. 2 fuel. One buyer was reported to be willing to pay $3 per barrel for Bunker "C" fuel oil for export to Europe.

• Oklahoma

Oil Pool Opened Northwest Of Old Sholem Alechem Area

Stanolind opens oil pool in old Stephens County area; Murray County gets first commercial oil production; offsets staked in new Lincoln County oil area; 18th producer completed in Wayne pool; large gasser brought in at Witcher pool; Alfalfa County wildcat drills on after gas shows.

Stephens County: A pool has been opened near the old Sholem Alechem area by Stanolind Oil & Gas Company. Sims 1, NE NE SE 2-1s-4w, swabbed 6 barrels of 30-gravity oil per hour on initial test from the Springer sand zone, topped at 4715 feet and based at 5070 feet. The well was taken to 6770 feet in the Mississippi-Caney, and was plugged back to find oil in the Springer. First perforations, at 5060-80 feet, showed dry; perforations at 4848-87 feet showed 1 barrel of oil per hour, and after perforating at 4715-95 feet, the well swabbed 6 barrels per hour. Casing has been set at 5100 feet. The well is northwest of the Sholem Alechem field discovered in 1923 by Humble Oil & Refining Company's Jennings 1, SW SW SE 28-1s-3w, on the Carter County side. Development of the area continued through a period of approximately 4 years, and 19 sand zones were found productive, the shallowest at 1890 feet and the deepest at 4200 feet.

Murray County: Sohio Petroleum Company was installing pump to complete Purtle 1, SE SE NE 23-1n-2e, 3½ miles northeast of Davis. The well will give the county its first commercial oil production, and will make the county the 48th productive in Oklahoma. The well bailed an average of 15 barrels of 16-gravity oil for 24 hours from the basal McLish sand at 1490-1545 feet, plugback depth.

Lincoln County: Two tests have been started near Davon Oil Company's Dye 1, SE SW NW 15-14n-5e, pool opener which is flowing 30 barrels of oil per hour from the Prue sand, from 3370-3422 feet. Garr-Woolley Company's Deans 1, is in NE NW SW 15-14n-5e, and C. & A. Drilling Company's McCracken Fee 1, is in SW SW 10-14n-5e. Drilling is under way, and it is expected the wells will pick up the Prue at around 3300-50 feet.

McClain County: The 18th producer has been added to the Southwest Wayne field by Big Chief Drilling Company et al. Community 1-B, NW SE NE 23-5n-2w, on the west side of the area, has been finaled for a flow of 198 barrels of oil in 6 hours through ½-inch choke, casing set at 6906 feet. Total depth is 6965 feet.

Oklahoma County: Another big gasser has been added to the Witcher gas field by Oklahoma Natural Gas Company. Lair 1, C SW SW 21-13n-2w, newest producer of the area, was shut in after making 30 million cubic feet of gas daily from the Bois d'Arc section of the Hunton lime. The well was treated with 2500 gallons of acid preceding the flow. Production is from 120 perforations at 61-20-40 feet, and total depth is 6171 feet.

Alfalfa County: The county's most interesting wildcat is drilling on after getting shows of gas in the Mississippian. The Texas Company's McArthur 1, NE SW SW 18-28n-12w, was drilling at 5600 feet after gauging an estimated 250,000 cubic feet of gas daily from 5034-64 feet in the Mississippian.

Repressuring Approved

A plan to repressure the Pettus sand in the South Burnell field with flare gas from the Wilcox of the Burnell field, Karnes County, was approved by the Texas Railroad Commission last week. Luling Oil and Gas Company, the operator to which the permit was granted, plans to inject 6,900,000 cubic feet of gas per month.

Colorado Map Issued

The Geological Survey has released a new map of Colorado showing the location of test wells drilled for oil and gas outside the known productive fields of the state. Copies of the map, issued as Preliminary Map 73 of the Oil and Gas Investigation series, are available at 40 cents each from Survey offices in Washington, Denver, Tulsa, and Casper.

• Kansas

Sohio Wildcat Opens Oil Pool Northeast of Saundra Area

Sohio well opens oil pool near Saundra area; Weitzel wildcat completed for 673 barrels daily; Barton County test receives potential.

Stafford County: A pool has been opened 1½ miles northeast of the Saundra pool by Sohio Petroleum Company. Schrepel 1, SE SE SE 12-21s-12w, made 363 barrels of oil per day on initial pumping test from the Arbuckle lime at 3480-515 feet. Arbuckle was topped at 3479 feet, with total depth 3515 feet. Sohio has been particularly active in the areas of western Kansas during the first part of 1947.

Rush County: One of the most closely watched wildcats in the state has been completed for 673 barrels of oil per day. Darby & Bothwell, Inc.'s Weitzel 1, discovery of the Weitzel (Gorham) pool is SW NW NW 1-16s-20w, was plugged back to the Kansas City lime at 3695 feet after failure in the deeper Gorham equivalent. The test is 3½ miles south of the Penny-Wann pool, and has established a new producing horizon for the

Wells Completed in the United States in Week Ended August 2, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1946
Alabama	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Arkansas	3	1	...	...	1	5	...	...	...	...	1	1	6	6	5
California	28	...	...	...	...	28	1	...	...	...	5	5	34	31	33
Colorado	3	...	...	...	...	3	...	1	...	...	1	2	5	6	4
Florida	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Georgia	...	...	...	...	...	...	...	...	...	...	2	2	2	...	...
Illinois	20	...	...	...	10	30	...	1	...	...	8	9	39	45	56
Indiana	6	...	...	...	5	11	...	3	...	...	...	3	14	15	17
Kansas	30	...	3	...	13	46	...	2	...	...	6	8	54	59	41
Kentucky	5	...	...	...	4	9	...	...	...	...	1	1	10	11	12
Louisiana	20	...	2	...	7	29	...	2	...	...	11	13	42	20	39
N. Louisiana	12	...	2	...	7	21	...	...	...	...	11	11	32	13	23
S. Louisiana	8	...	...	...	...	8	...	2	...	...	...	2	10	7	16
Michigan	8	...	...	...	2	10	...	...	...	...	2	2	12	14	14
Mississippi	7	...	2	...	...	9	...	...	...	...	1	1	10	13	2
Montana	...	...	1	...	2	3	...	...	...	...	...	...	3	12	10
New Mexico	15	...	...	...	1	16	2	...	...	...	1	1	19	16	3
New York	14	...	1	16	1	32	...	...	...	...	...	...	32	30	25
Ohio	3	...	22	...	13	38	...	...	...	...	...	...	38	24	27
Oklahoma	48	...	2	1	27	78	2	1	...	...	9	10	90	65	67
Pennsylvania	20	...	13	22	3	58	1	...	...	...	...	...	59	57	48
Texas	102	...	15	...	47	164	3	13	2	...	22	37	204	226	156
DISTRICTS:															
1—S. Central	2	...	...	...	1	3	...	1	...	...	1	2	5	9	2
2—Middle Gulf	9	...	...	...	...	9	...	2	1	...	1	4	13	13	[1]
3—Upper Gulf	5	...	1	...	5	11	...	1	1	...	4	6	17	24	5
4—L. Gulf-S.W.	6	...	1	...	4	11	1	4	...	...	2	6	18	19	22
5—E. Central	...	...	...	...	2	2	...	...	...	...	...	...	2	4	[2]
6—Northeast	6	...	1	...	6	13	...	...	...	...	...	...	13	17	15
7-B—N. Central	5	...	1	...	6	12	...	1	...	...	...	1	13	21	[3]
7-C—W. Central	4	...	...	...	...	4	...	1	...	...	...	1	5	6	[4]
8—West	41	...	...	...	4	45	2	1	...	...	5	6	53	48	37
9—North	20	...	2	...	18	40	...	2	...	...	8	10	50	56	66
10—Panhandle	4	...	9	...	1	14	...	...	...	...	1	1	15	9	9
West Virginia	2	...	12	...	2	16	...	...	...	...	...	...	16	17	16
Wyoming	6	...	...	...	...	6	...	...	...	...	2	2	8	7	2
Total U.S.	340	1	73	39	138	591	9	23	2	...	72	97	697	677	578

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] North Central included with North. [4] West Central included with West.

area, in which no other tests have been drilled.

Barton County: A state potential of 180 barrels of oil daily has been given Bridgeport Oil Company's Hunt 1-A, NEC 32-17s-14w. The well is producing from the Kansas City lime, drilled to 3473 feet, total depth, and is credited with opening the new Hunt pool. The well is a mile southwest of the Carroll pool.

• New Mexico

Lea County Test Has First Simpson Production in State

Plugged-back Ellenburger producer in Lea County develops first Simpson production for state; deep exploration in Monument field lists 2 prospective oil zones below regular Permian. Chaves County wildcat without shows in Ordovician.

Lea County: Amerada Petroleum Corporation's Hare 6, NW SW 33-21s-37e, northwest edge of the Brunson field and temporarily completed in structurally-low Ellenburger at 8110-60 feet, has been plugged back for completion as the first Simpson producer for the state. Perforations at 7780-7830 feet in Simpson, topped at 7375 feet, resulted in potential of 980 barrels of 41-gravity sweet crude, with gas-oil ratio 585/1 through ½-inch choke after washing with 500 gallons of mud acid. The presence of Simpson production has been known previously through drill-stem tests of wells carried to the Ellenburger.

Repollo Oil Company's State 2-367, C NW SW 36-21s-37e, northeast edge of the Paddock field and a failure in the Glorietta and Clear Fork zones, was drilling lime at 7050 feet to explore the Devonian or lower zones.

Magnolia Petroleum Company's Santa Fe-Pacific 1-A, C SE SW 33-10s-36e, is moving in rig for a 5200-foot San Andres lime test near northwest edge of Ranger Lake and 13 miles southwest of Devonian Oil Company's pumping discovery for the Sawyer field.

Amerada's Phillips 5, C NE NE 1-20s-36e, near apex of the Permian structure for the Monument field, was drilling at 6462 feet on Ellenburger objective. This initial deep test for the large field passed up maximum flow of 15 barrels of oil per hour for new zone at 5200-23 feet in Glorietta, topped at 5121 feet with elevation 3587 feet. Prospective oil production also was indicated in the 5500-foot Yeso. This development paves the way for possible large-scale deep drilling, and deepening of old wells.

Chaves County: Richfield Oil Corporation et al's Mullis-Federal 1, C SE SW 21-15s-29e, wildcat, was drilling Ordovician dolomite at 11,920 feet without shows. The Simpson was entered at 11,650 feet.

Louisiana Allowable Up

Oil production in Louisiana for August has been raised by the Louisiana Conservation Commission to 468,359 barrels daily, an increase of 4873 barrels daily over July's allowable. Increases were ordered for all districts with the exception of Lafayette, which was cut 129 barrels daily, leaving an allowable of 127,046 barrels.

• West Texas

Ector County Test Uncovers Additional Clear Fork Pay

Ector County semi-wildcat encounters additional pay in Clear Fork; water level may have been reached in Goldsmith-Ellenburger field discovery; Three-Bar field expanded southeast by structurally low well; Fullerton field has fifth Ellenburger completion.

Ector County: Phillips Petroleum Company and The Texas Company's Cowden-McEntire 1, near C NE NE T&P Ry. 18, Block 44, T-1-N, semi-wildcat that has indicated flush production from the Clear Fork possibly to link the Andector and Goldsmith-Clear Fork areas, failed to encounter water in drilling through the Clear Fork pay to 6445 feet. This well flowed at a rate of 27 barrels of oil hourly, with gas volume rated at 2½ million cubic feet daily from 6125-200 feet. Seven drill-stem tests at short intervals to 6375 feet failed to develop water, and fair to good showings continued to 6350 feet.

Gulf Oil Corporation's Goldsmith 430-E, Ellenburger-pay discovery for the Goldsmith field, was making another drill-stem test to determine if formation water had been reached in drilling to 9620 feet, or 125 feet in the formation. A drill-stem test at 9570-620 feet yielded gas to the surface within 8 minutes at a rate of 762,000 feet daily, and flowed 40 barrels of 46-gravity oil in ¾ hour. However, the drill pipe contained 100 feet of salty-sulfur water, thus indicating that the water table may have been reached.

Gulf and Kewanee Oil Company's University 1-A, ¾ mile southeast of the Ellenburger-pay discovery for the Jordan field and structurally low, encountered sulfur water in the Ellenburger at 9390-456 feet. The hole has been plugged back to try for production in Silurian, with 5½-inch casing at 8238 feet.

Andrews County: Stanolind Oil & Gas Company's University 1-AF, C NW SW Sect. 16, Block 11, ½ mile east of the most southerly Devonian producer in the Three-Bar field, set pipe to complete after flowing oil through tester at 8266 feet. The Devonian was entered at 8040 fee, with elevation 3352 feet, being the lowest of the 6 producers, and the Silurian at 8240 feet. The Silurian has not heretofore produced in this area.

Texas Pacific Coal & Oil Company's Jackson 16-E, SW NW PSL 17, Block A-32, northeast edge of the Ellenburger producing sector of the Fullerton field and fifth well for this zone, flowed 1862 barrels of 40.8-gravity oil initial through ¾-inch choke, with gas-oil ratio 151/1. Production is from open hole at 9735-815 feet. The well is the highest structurally of the group.

Crockett County: Humble Oil & Refining Company's Mitcham 1, NE NE D&SE 12, Block AB, opener of a new Ellenburger producing structure, was drilling out cement to complete through perforations after landing 5½-inch casing on bottom at 8165 feet. The water table was established in using tester at 8140-60 feet. This wildcat entered the Ellenburger at 8025 feet, with gas-distillate pay in the upper section, and flowed 42 barrels of oil in 1 hour when tester was used at 8097-8120 feet.

Sinclair Prairie Oil Company and The Atlantic Refining Company's University 1-66, Ellenburger discovery for the Midway Lane prospect, recorded natural potential of 1232 barrels of 49-gravity oil and gas-oil ratio of 2650/1 through ½-inch choke, with 1450 pounds back pressure on tubing. Flow is from perforations at 7530-75 feet. The gas-oil contact is near the 7512-foot level, and oil-water contact at 7640 feet or lower. In view of the probable production penalty for gas-oil ratio, the well may be perforated lower in the formation. A direct pipe line connection is due within 3 weeks.

Byrd & Frost, Inc., and Gulf's Mayberry 1, 5⅝ miles southwest of the crockett shallow field, was drilling at 5865 feet on Ellenburger objective. No significant shows have been recorded in the Permian beds.

Crane County: Gulf's Waddell 101-E, C SE SE PSL 27, Block B-25, ½ mile north by east of its recent Ellenburger discovery for the University-Waddell field, entered the Devonian at 8430 feet, or 27 feet low, and was drilling at 8688 feet. No drill-stem tests have been made of the section, which indicated commercial flow but passed up by the discovery.

Cochran County: Stanolind's Hall 1, NW SW PSL 13, Block L, south edge of the Landon 2-well pool and occupying the highest structural position, cemented protection string of 7-inch pipe at 7504 feet to continue to 11,000 feet, or water, in the Ellenburger. The Clear Fork, entered at 6430 feet, with elevation of 3807 feet, proved barren.

Wildcat Failures: Stanolind's Gaskins 1, Howard County, entered Ellenburger at 10,315 feet, with elevation 2555 feet, and developed artesian flow of sulfur water through testing tool at 10,366 feet. In Menard County, American Republics Corporation's Bradford 1, quit in granite at 2745 feet. H. L. Hunt et al's Bundy 1, Sutton County, entered barren Ellenburger at 4445 feet, and abandoned at 4505 feet.

• North Texas

Two Clay County Discoveries Are Given Official Gauges

Two Clay County strikes given official gauges; Throckmorton County wildcat lists second oil pay; Fargo field discovery reworked for Ellenburger producer.

Clay County: L. T. Burns et al's Talley 1, SE SW Block 12, J. H. Belcher Survey, confirmed a new Strawn field on the southwest flank of the Joy structure in flowing 217 barrels of 43-gravity oil, gas-oil ratio 550/1, on natural test through ¼-inch choke from open hole at 4449-66 feet. This strike is 1⅛ miles southwest of a Mississippian well, nearest producer.

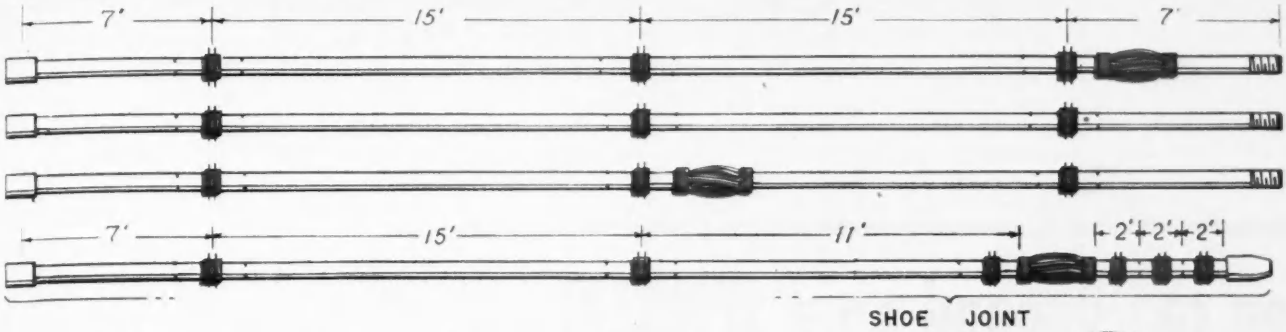
Grace & Grace et al's Edwards 1, northwest corner of Block 41, Marion County School Lands, provided a ⅝-mile southeast extension and a new oil horizon for the Bryant Edwards pool in flowing 1440 barrels of 41-gravity oil, gas-oil ratio 400/1, daily through ¾-inch choke after multiple acid treatments of open hole at 6308-40 feet. This production is from the Ordovician, while wells in the field proper produce from the Bend lime.

Throckmorton County: Jas. H. Snowden et al's Howlsey 1, NWc SE BBB&C Survey 300, with prolific discovery assured from the Bend at 4138-48

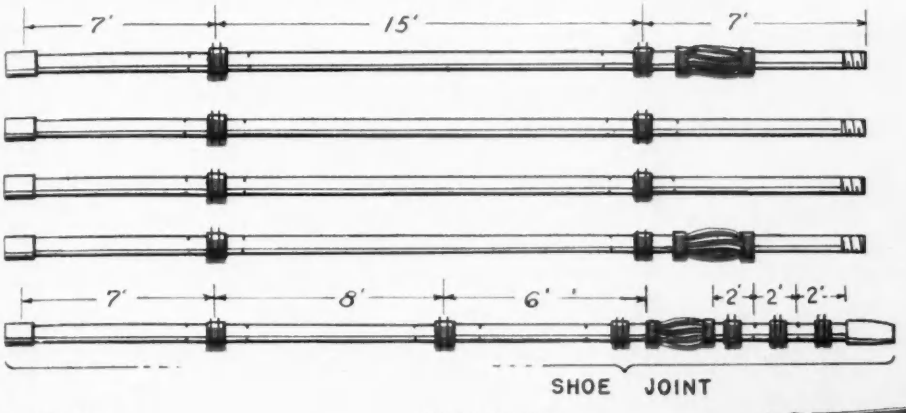
FOR BEST CEMENTING RESULTS

Install Weatherford Spiral Centralizers and Reversible Scratchers as follows:

RANGE THREE PIPE APPROX. 44 FT. LONG



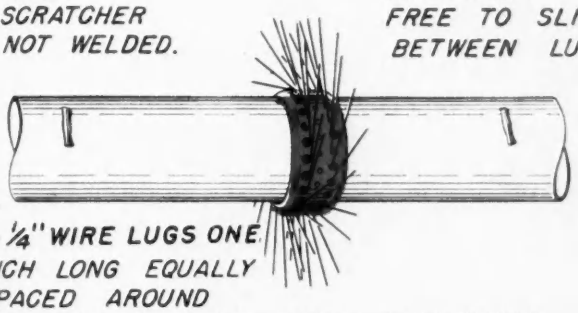
RANGE TWO PIPE APPROX. 29 FT. LONG



THE DIAMETER OF THE GAUGE BAND AROUND THE CENTRALIZER SPRINGS SHOULD BE 1" LESS THAN THE DIAMETER OF THE HOLE. THUS, WHEN THE BAND IS REMOVED, THE SPRINGS WILL EXPAND ABOUT 3/4" AND THE BELLY OF THE CENTRALIZER WILL BE A FRACTION SMALLER THAN THE HOLE - AN IDEAL CONDITION.

NOTE: SCRATCHER NOT WELDED.

SCRATCHER FREE TO SLIDE BETWEEN LUGS.



3-¼" WIRE LUGS ONE INCH LONG EQUALLY SPACED AROUND PIPE AND 2 FEET APART LENGTHWISE

NOTE: BOTTOM END OF CENTRALIZER IS SPOT WELDED TO PIPE FIRST, WITH 3 WELDS APPROX. 2½" LONG EQUALLY SPACED ABOUT CIRCUM. OF PIPE. THE HORSESHOE LUGS ARE THEN INSERTED IN SLOTS IN TOP COLLAR OF CENTRALIZER AND ARE WELDED TO PIPE ON INSIDE OF LUGS ONLY.

REMOVE GAUGE BAND AFTER WELDING.

All measurements are approximate, and calculations are from the shoe joint which is equipped first.

For Range Three Pipe:

- 6 scratchers and 1 centralizer on shoe joint, as shown.
- Next joint above, 3 scratchers and 1 centralizer — this centralizer approximately 60 ft. above one on shoe joint.
- All succeeding centralizers approximately 90 ft. apart, with one on the last joint above scratchers.
- Each joint above the shoe joint is equipped with 3 scratchers spaced approximately 15 ft. apart.

For Range Two Pipe:

- 6 scratchers and 1 centralizer on shoe joint, as shown.
- Next joint above shoe joint, 2 scratchers and 1 centralizer as illustrated.
- All succeeding centralizers approximately 90 ft. apart, with a centralizer on the last joint above scratchers.
- Each joint above the shoe joint is equipped with 2 scratchers. All scratchers are spaced approximately 15 ft. apart.

For best results, reversible scratchers and spiral centralizers should be run throughout the cement fill.

A Weatherford Engineer in your area is ready at all times to assist you with your cementing problems.

A collect telephone call, LD 1, Weatherford, Texas, will summon him to your job in quick order.

WEST COAST PLANT
3316 Jewett Avenue
Bakersfield, Calif.
Telephone 4-4334

WEATHERFORD SPRING COMPANY
Manufacturers of Oil Well Specialties
WEATHERFORD, TEXAS . . . Telephones: 257 and LD 1

EXPORT OFFICE
617 South Olive St.
Los Angeles, Calif.
Telephone VAndyke 8409

feet, developed oil and gas flow through tester from Marble Falls at 4567-77 feet, and was drilling at 4640 feet to explore the Ellenburger before setting pipe for completion. This wildcat is 2 miles northeast of Snowden et al's recent Bend discovery on the Bailes-Parmenter-Jones Unit.

Wilbarger County: Amerada Petroleum Corporation's Dodson 6-B, south by west offset to the Ellenburger-pay discovery for the Fargo field and 25 feet structurally low, flowed 293 barrels of oil through ½-inch choke daily for completion from Ellenburger open hole at 6273-6330½ feet, having plugged back from water at 6346 feet. Amerada is drilling 4 additional Ellenburger tests, and also reworking Goodpasture 1, which was completed July 2, 1940, as the discovery from the Cisco at 3230-52 feet after plugging back from 6717 feet. The latter indicated commercial production from the Ellenburger, but was plugged back to develop the shallower zones due to an adverse crude market. Goodpasture 1 will be recompleted from perforations and open hole below 6306 feet, and flowed 600 barrels of fluid, including 60 percent oil daily while attempting to plug off bottom-hole water.

• East Texas

Hopkins County Wildcat Runs High in Testing Paluxy

Hopkins County wildcat registers high structural position in testing the Paluxy; Freestone County wildcat will set pipe for production test; Larue field assured of third flowing well.

Tom G. Shaw, Trustee's Lee and Thomas 1, John Blocker Survey and 4½ miles south of Cumby, attracted interest in western Hopkins County due to correlating high to failures along the fault trend, and was coring at 5735 feet for the sand phase of the Paluxy series. No water was evident in the upper section, topped at 5652 feet with elevation 562 feet, or 117 feet high to Homer W. Snowden et al's Warren 1, a 6127-foot failure 2 miles northeast. This wildcat is supported by a block of 6200 acres.

Freestone County: A. F. Richardson et al's Sessions 1, S. A. Sweet Survey and 3 miles west by north of Kirvin, was credited with a nominal oil showing in Woodbine at 3353-85 feet, and was due to drill through the section and set pipe for production test.

Henderson County: Lone Star Producing Company's Murchison & Wofford 1, northeast outpost for the Larue field, was running pipe to complete at 8242 feet after flowing oil through testing tool from the Bacon lime.

Anderson County: Sanders & Murchison's Broadway 1, Blackfoot prospect that indicated probable oil production from the Upper Rodessa, was conditioning mud at 9906 feet in Travis Peak, topped at 9870 feet.

Wood County: Humble Oil & Refining Company's Rio Oil Corporation 1, Yantis prospect that passed up promising gas-distillate production in the 7700-foot Rodessa in drilling to 8510 feet, was making a routine test of perforations at 8041-54 feet, and will progressively preforate and test higher.

• Southwest Texas—Lower Coast

Stanolind Has Oil Discovery 3½ Miles from Kingsville

Stanolind has discovery near Kingsville; gas field discovered in Starr County; potential due on oil discovery near La Reforma.

Kleberg County: Stanolind Oil & Gas Company's J. O. Johnson 2, wildcat 3½ miles southeast of Kingsville, has been completed as an oil field discovery. From perforations at 6040-46 feet the well flowed on potential 74 barrels of 43-gravity oil daily through 3/16-inch choke with gas-oil ratio 2832/1 and tubing pressure 525 pounds, casing sealed. Total depth is 9798 feet and gas-condensate was tested in perforations at 7830-36, 7738-44, and 7440-46 feet. Oil, gas and salt water were tested in a series of perforations at 6186-96 feet.

Starr County: W. B. & Jewel Osburn and Mid-Continent Petroleum Corporation's John Clopton 1, wildcat 6½ miles east of Rio Grande City, is the discovery of a gas field. First test at 4025-45 feet tested dry. A second at 4430-50 feet recovered gas-cut mud with 1660 pounds bottom hole pressure. These perforations were squeezed and casing perforated at 5660-700 feet where in 6 hours the well developed 125 pounds working pressure through ¼-inch choke and recovered 780 feet of muddy water and oil. Additional perforations were made in the same zone and the well was shut in after flowing dry gas. Total depth is 6256 feet with 5½-inch casing set to 6035 feet.

J. Simmons et al were waiting on

You can depend on a JENSEN . . .

When Nature Fails

You're lucky when nature lifts your oil for you.

But any well that has to go on the pump can still be profitable when you choose a Jensen. These units are built around 27 years experience, by mass production methods, for only one purpose—to pump oil economically. Years of dependable performance can rightfully be expected whenever and wherever you install a Jensen.

For complete information, see your Jensen dealer or write direct to the factory.

JENSEN BROTHERS MANUFACTURING CO.
Coffeyville, Kansas, U.S.A.

EXPORT OFFICE: 50 CHURCH STREET, NEW YORK CITY

PLANS AND SPECIFICATIONS

Insuring coordinated methods with no gap in control

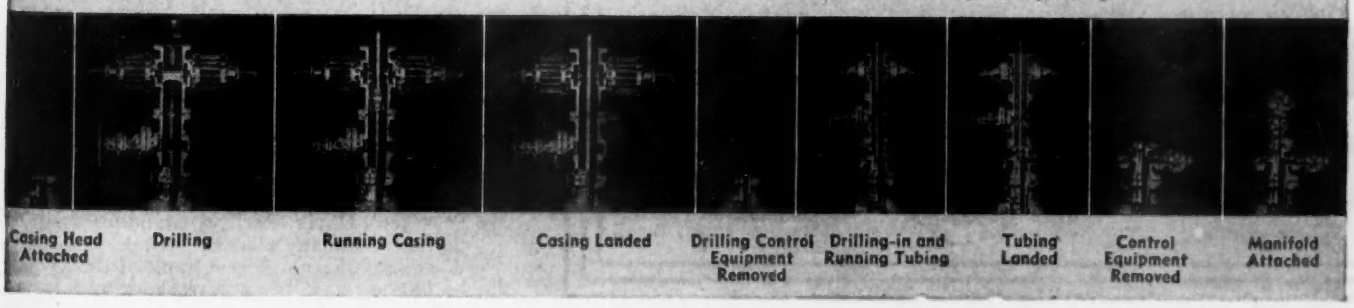
Complete well control can be assured only when planned procedure is followed, studying the drilling of a well in a particular territory, as a whole. During the study, each step in the sequence of operations is drawn on paper as it will be performed in the actual drilling of the well. The preparation of these complete plans and specifications precedes making a list of materials for the accomplishment of these plans. Gray Systems of Well Control are coordinated methods, providing the highest degree of control and operating efficiency for performing the entire sequence of operations from drilling through producing the well. There is no gap in control when you use Gray Systems of Well Control.

Gray Systems of Well Control are on the job around the world, shouldering the problems of men who have to work in well control. Knowledge gained from problems solved with men who actually drill oil wells is available to you when you use Gray Systems of Well Control.

Complete Well Head Assembly Equipped with Composite Manifold, Valve Removal, Installation and Renewal.

GRAY TOOL COMPANY
HOUSTON

Export Representative: GUY E. DANIELS, 30 Rockefeller Plaza, New York City
Rocky Mountain Representative: CARL MOULDEN, P. O. Box 1890, Casper, Wyoming



potential at the First National Bank of Mission 1, oil discovery 3 miles north of La Reforma field. This wildcat tested good oil flow from 2 sands, 1 at 6421-27 feet and the other at 6112-17 feet. Dual-completion may be attempted. Total depth is 7505 feet with 5½-inch casing set to 6504 feet.

• Middle Texas Coast

Goliad County Wildcat Tests Gas, Condensate from Slick

Goliad wildcat tests gas and condensate from the Slick; new pay zone discovered at La Rosa field.

Goliad County: Sunray Oil Corporation's Brandt 1, wildcat 8500 feet northwest of the Weser field, tested gas and condensate from latest perforations at 7478-83 feet in the Slick sand. Prior to setting casing a drill-stem test at 7709-25 feet in the Luling developed 130 pounds working pressure in 30 minutes and recovered 1220 feet of 31.5-gravity oil. Another drill-stem test at 7715-25 feet developed 62 pounds working pressure in 15 minutes and recovered 4135 feet of 31.1-gravity oil. Total depth is 8513 feet with 5½-inch casing set to 7770 feet for completion.

Refugio County: Stanolind Oil & Gas Company's B. D. Rooke 37, La Rosa field, has discovered a new pay zone. From perforations at the 6850-foot level the well flowed on potential 187 barrels of oil daily through ⅛-inch choke with gas-oil ratio 1228/1 and tubing pressure 1290 pounds. Total depth is 9524 feet with 5-inch liner set to 6943 feet.

• Upper Texas Coast

Chapel Hill Area Wildcat Makes Oil Recovery On Test

Chapel Hill wildcat makes show of oil; potential made on South El Campo discovery; 2 producers add to Boling Dome; West Orange well recompleted in new Miocene sand; blowout in South Mayes test under control; Tyler County wildcat gets show of oil.

Washington County: The Union Sulphur Company's Joseph Kubeczka 1, wildcat in Chapel Hill area, recovered oil and salt water on latest drill-stem test. First test at 9501-40 feet, using ⅜ and ¼-inch chokes, recovered 15 stands of muddy acid water with 2600 pounds bottom hole pressure after being acidized with 2000 gallons. Following this test, hole was plugged back to 9400 feet and a drill-stem test run at 9460-66 feet, using ⅜ and ¼-inch chokes, developed 50 pounds working pressure at the top and recovered 810 feet of 35-gravity oil, 21 stands of oil- and gas-cut mud, and 58 stands of salt water. Bottom hole pressure flowing was 3000 pounds. Total depth is 10,965 feet with 7-inch casing set to 9500 feet. A squeeze job has been made of the perforations at 9460-66 feet and casing will be reperforated at this interval for a new test.

Wharton County: Floyd L. Karsten's Frank Beal 1, oil discovery in the South El Campo area, has been given potential test. On 24-hour gauge it flowed 82½ barrels of 32-gravity oil through 9/64-inch choke with tubing pressure 725 pounds, casing pressure 1750 pounds, and gas-oil ratio 700/1. Total depth is 7050 feet with 5½-inch casing set to 6618 feet and perforated at 5561-64 feet for completion.

Two oil wells have been completed at Iago townsite in the new producing area at Boling Dome. Grubb & Hawkins' Iago Downtown Unit 2 has been completed for a potential of 133 barrels of 29.7-gravity oil daily through 9/64-inch choke with 540 pounds tubing pressure and 750 pounds casing pressure. Total depth is 5212 feet with casing perforated at 5152-64 feet for completion. Union Oil Company of California's C. J. Ueckert 1 has been completed for potential of 152 barrels of 29.5-gravity oil daily through 9/64-inch choke with gas-oil ratio 342/1. Total depth is 5182 feet with casing perforated at 5124-40 feet for completion.

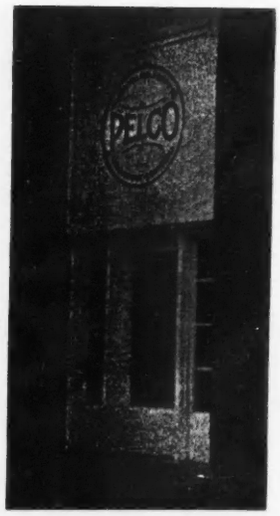
Orange County: In West Orange field G. E. Glasco has reworked the Lutcher & Moore 1 and completed it in a new Miocene sand. The well was completed originally in 1936 at total depth of 6975 feet. Present completion is from perforations at 3475-85 feet in hole plugged back to 3524 feet. On initial test the well flowed 246 barrels of 24-gravity oil daily on 3/16-inch choke with 150 pounds tubing pressure.

Chambers County: Humble Oil & Refining Company's Lula Wallis et al 2 South Mayes area, encountered a high-pressure sand while being deepened to 12,056 feet and blew out, making gas and condensate. The well was soon placed under control with 1900 pounds gauged on the drill pipe.

Tyler County: American Republics Corporation's Kirby Petroleum Company et al 1, wildcat in the Sarah Fields survey, about 5 miles southwest of Fred, recovered 56 barrels of oil and 40 barrels of salt water on a drill-stem test from perforations at 9070-78 feet.

A National Disgrace

A public accountant calls in a client to remonstrate with him for sharp business practices, and to point out the futility of too much profit in one fiscal year. The conduct of automobile dealers since the war constitutes a major indictment of free private enterprise. And we can ill afford that.



WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 39 YEARS

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT
LOUISIANA

PELCO

Berwick
New Iberia
Lake Charles

• South Louisiana

Beauregard Parish Given Oil Discovery Near Perkins Field

Oil pool opened in Beauregard Parish; gas discovery completed south of Barataria field; Welsh Dome flank discovery recompleted for good oil well; Magnolia completes deepest test in Iowa field.

Beauregard Parish: The Union Sulphur Company, Inc., has made an oil discovery at W. E. McFatter 1, 34-7s-10w, about 3 miles east of the Perkins field. On 24-hour test the well flowed 129.84 barrels of 29.5-gravity oil through 7/64-inch choke from perforations at 6498-506 feet. Tubing pressure was 1600 pounds, and gas-oil ratio estimated at 1311-1. Total depth was 6540 feet with 7-inch casing cemented on bottom.

Jefferson Parish: The California Company's E. P. Brady et al 9, wildcat about 1½ miles south of the Barataria field, was completed as a gas discovery with an initial gauge on open flow of 240 million cubic feet per day. Total depth is 12,307 feet with 7-inch casing at an unreported depth. A squeeze job was conducted through perforations at 11,888-92 feet.

Jeff Davis Parish: Stanolind Oil & Gas Company's T. S. Stegall 1, discovery for the northwest flank of the Welsh Dome, has been reworked and com-

pleted as an oil well in a new pay. The well made 112.44 barrels of 38.2-gravity oil per day through ¼-inch choke from perforations at 6545-65 feet. Gas-oil ratio was 640-1, with tubing pressure 500 pounds. The well originally was completed with 50 perforations at 6843-55 feet. Original potential was 28.1 barrels of 44.8-gravity oil and 2,080,000 cubic feet of gas daily. Production gradually went to salt water and the well was plugged at this level.

Calcasieu Parish: Magnolia Petroleum Company's B. T. Wait 20, deep test at Iowa field, had a potential flow test prior to a state potential and made 109.2 barrels of 44.4-gravity oil through 9/64-inch choke daily. Tubing pressure was 5800 pounds with gas-oil ratio 20,295/1. Perforations were made at 9474-76 feet. Total depth is 10,107 feet with 5-inch liner set below perforations. This is reported to be the first test to go into salt at the Iowa field. Considerable trouble was encountered with high-pressure gas. The well was bled down from 5200 to 1100 pounds and squeezed from perforations at 9476-78 feet. Hole was reperforated for the final completion.

• North Louisiana

Wildcat in Catahoula Parish Prepares for Production Test

Catahoula wildcat readying for production test; Bellevue deep test has disappointing drill-stem test; Logansport deep test drilling below 9000 feet.

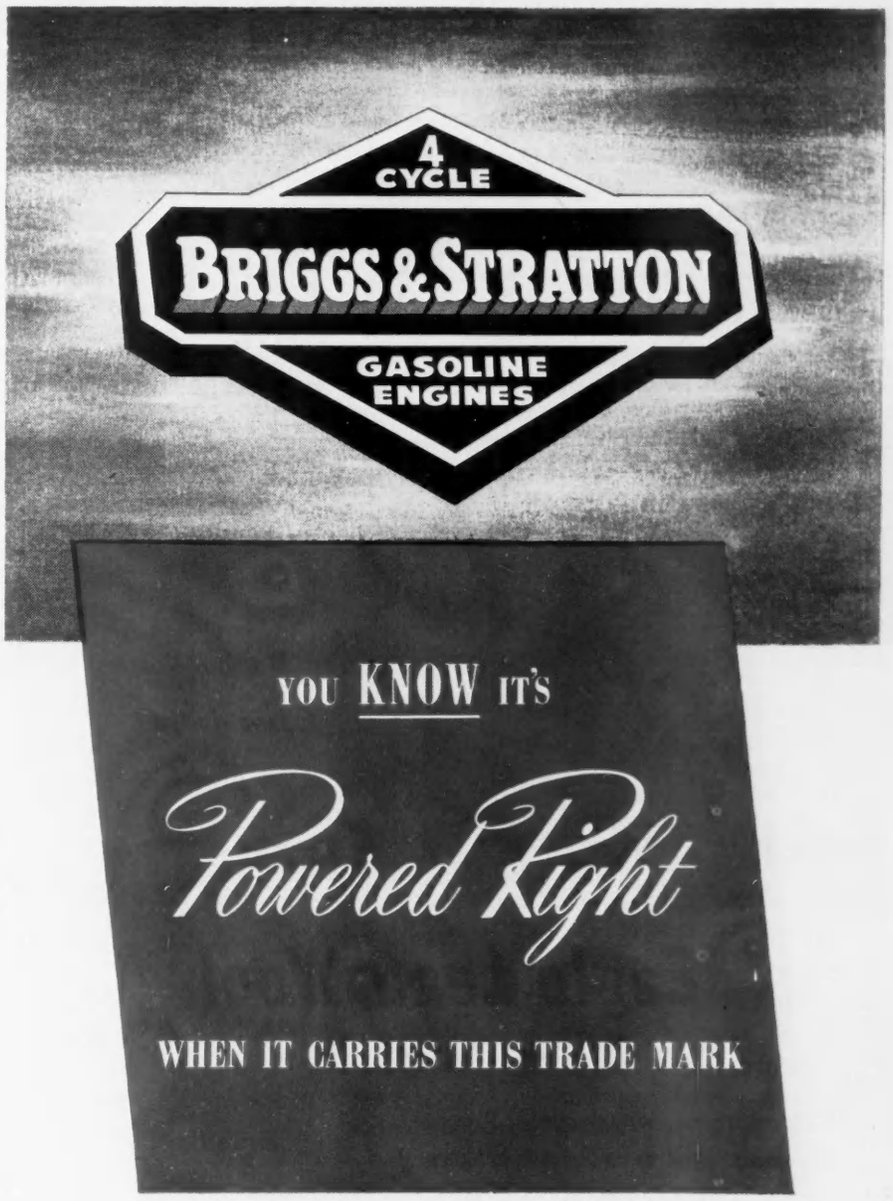
Catahoula Parish: Pan-American Production Company will run casing for production test at Lydia R. McGraw et al 1, C SE SE SE 24-10n-8e, wildcat 3 miles south of Sicily Island. Test will be made of the Massive sand in the Tuscaloosa, where a good kick was indicated on drill-stem test at 5840-50 feet. The showing was confirmed by sidewall samples. The well is bottomed at 6042 feet.

Bossier Parish: Mayfield Drilling Company's W. J. Scott 1, deep test in the Bellevue field, 24-19n-11w, took a drill-stem test at 4085-115 feet and recovered salt water with slight showing of gas and no indication of oil. The test is still bottomed at 4569 feet while crew completes recovery of stuck drill stem and cleans out hole. Contract depth is 5000 feet.

Texas Gulf Producing Company and Michel T. Halbouty have located Moorey 1, 150 feet west of center of 28-19n-11w, on the south flank of the old Bellevue Dome. Contract depth is reported to be 3000 feet. The test is 900 feet south of Standard Oil Company's Moorey 1, completed in 1920 for 10 million cubic feet of gas from a pay below the anhydrite, either Kilpatrick or Rodessa. The well was abandoned when casing collapsed, but light green oil has been seeping from around the plug and it is reported that the well would make about 4 barrels of oil per day when the valve on the well head is opened.

Concordia Parish: H. L. Hunt et al's Fisher Lumber Company 1, wildcat in 25-7n-8e, also was stopped by a fishing job at 8400 feet.

DeSoto Parish: Skelly Oil Company's deep wildcat on the north flank of the Logansport field, Thelma Nash 1, SW NE 20-12n-16w, is drilling below 9185 feet.



The ever-increasing *preference* of users and dealers for equipment powered by engines bearing this world-famous trade mark, is a tribute to the record for *dependable operation* made by *more than 3 million* Briggs & Stratton 4-cycle air-cooled engines. Because they incorporate the constant engineering advancements . . . improved methods of precision manufacture . . . technical knowledge and experience of over 27 years of *continuous production*—today's Briggs & Stratton engines have no equal in value and performance.

BRIGGS & STRATTON CORPORATION, MILWAUKEE 1, WIS., U. S. A.

• Arkansas

Warnock Springs and Wesson Fields Get Good Producers

Good producers completed in Warnock Springs and Wesson fields; 2 wildcats near final depths without shows.

Columbia County: McAlester Fuel Company completed the third Warnock Springs producer, Warnock Estate B-1, C NW 6-17s-19w, ⅜ mile from the discovery. The well was flowing at the rate of 3 million cubic feet of gas per day with 122 barrels of distillate.

Ouachita County: McAlester Fuel Company completed a good pumper in the Wesson field, A. C. Wesson B-2, SW NE NE 26-15s-19w, gauged 270 barrels of oil daily. Production is from 3095-110 feet, with total depth 3180 feet. Another good oil well was completed by Ormond Corporation at Mrs. E. Davis 1, C NE NW BE 26-15s-19w. It was on pump for 265 barrels a day through perforations at 3112-25 feet, with total depth of 3170 feet. The area is being steadily developed.

Miller County: Big Chief Drilling Company and Glasscock Drilling Company's wildcat, Alziena N. Froid 1, C NW SE NW 29-17s-27w, picked base of Annona by samples at 2766 feet, and is drilling below 4179 feet.

Little River County: Frank and George Frankel are drilling below 4597 feet at Nannie Locke 1, wildcat in C NE NW NW 19-13s-20w, with contract depth of 4700 feet anticipated soon.

Bottom Water is a drain on profits

Eagle Lead Wool

shuts out Bottom Water!

To insure an uninterrupted flow of oil from your wells, banish bottom water with economical Eagle Lead Wool. This finely stranded metallic wool, tamped around the hole, effectively seals every crack, becomes a permanent, non-corrosive plug. Packed in convenient 50-pound sacks—easy to place in special cartridge-shaped Eagle Wire Containers sized to fit all casings.

These 3 Eagle Bearing Metals meet most requirements

Eagle Dreadnaught — for extreme speed and heavy-duty conditions.

Eagle Outlasta — for medium speed and average-load conditions.

Eagle Durable—for low speed and light-duty conditions.

EAGLE LEAD WOOL

Seals off Bottom Water— keeps 'em flowing!

THE EAGLE-PICHER COMPANY

EAGLE Since EP 1843 PICHER

Cincinnati . East St. Louis
Chicago . Dallas . Kansas City

• Mississippi

Jones County Deep Test Continues to Get Shows

Jones County deep test continues to make shows in lower levels; new test slated for county; Smith County deep test quits; Mallalieu field flank test gets encouragement.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc Ne 29-6n-11w, continued with core test below 12,930 feet with the well reported headed for contract depth of 13,000 feet. Several sections of oil sand were cored below 12,220. Lowest section developing shows so far was at 12,898-904 feet which showed fairly porous sand saturated with dark brown oil. Cores below that level recovered shale with no shows. In the northern part of the county Union Sulphur Company's Earline Parker 1, NEc 31-10n-10w, potential producer, continued with swab in the effort to establish production. Eutaw was perforated at 5438-50 feet and a drill-stem test recovered 550 feet of heavy oil and 1100 feet of oil, mud and water. Hydrostatic pressure was 2775 pounds. Later, with packer at 5428 feet, the well was swabbed at the rate of 15 gallons of oil and 25 gallons of water per day. Casing has been reperforated at 5438-46 feet for further tests.

Another planned for the county is H. E. Williams' State 1, SWc SW SE 16-7n-11w, which was setting up derrick about 7 miles northeast of the Majors. The prospect will reportedly head for the Lower Tuscaloosa-Massive sand zone. Union Sulphur's A. E. Fall 1, NWc 8-9n-10w, Tuscaloosa test, is drilling below 4421 feet. No shows are anticipated for several hundred more feet.

Warren County: Amerada Petroleum Corporation's State of Mississippi 1, C NW NE 16-18n-2e, continued with core tests below 3795 feet after a drill-stem test failed. Shaly sand with streaks of stain were obtained in cores at 3875-83 feet and casing was perforated at 3718-883 feet, but subsequent drill-stem test recovered only mud and salt water.

Smith County: Danciger Oil & Refining Company's Smith County Oil Company 1, NW SW 2-1n-7e, was finally abandoned at 8407 feet in the Comanchean.

Simpson County: Hunt Oil Company's Smith County Oil Company 4, NW SW 15-2n-6e, Massive sand test, is drilling below 8354 feet. With Marine Tuscaloosa topped at 7942 feet, cores at 8161-72 feet recovered sandy shale, while those at 8275-85 feet recovered soft sand. No shows have been reported.

Lincoln County: C. H. Osmond's Grady Jordan 1, NW NE 29-6n-8e, which is drilling on the flanks of the Mallalieu field, was having encouraging results from tests after running into some trouble with salt water. After perforating casing at 10,481-94 feet, the well tested dry. Subsequently, it started flowing 12 barrels of oil per day through ¼-inch tubing choke. Tests continued.

Jasper County: Union Producing Company's Massey Unit 1, SWc NW 28-10n-13w, in the reactiviated Soso field, continued with tests of the field's producing zone. After coring several sections of gas sand at 6471-86 feet, a drill-stem test of the zone recovered only drilling mud. A subsequent drill-stem

3 Fast Daily Flights

TO THE

PERMIAN BASIN FIELD

From Houston, Dallas, Ft. Worth, Abilene, San Angelo, Amarillo, Lubbock, to

MIDLAND-ODESSA

Pioneer Air Lines offers morning, noon and night flights from Texas Metropolitan oil centers into West Texas and return. Flights are planned for the oil man's busy day with three convenient arrivals and departures daily. Consult your local Pioneer office for reservations.

	Phone
HOUSTON	W-9-4691
DALLAS	D-4-3939
FT. WORTH	6-8458
MIDLAND-ODESSA	2544
SAN ANGELO	7196
AMARILLO	2-6767
LUBBOCK	4646
ABILENE	6606

PIONEER AIR LINES

PIONEER Air Lines

GOVERNMENT DESIGNATED TO FLY AIR MAIL — PASSENGERS — EXPRESS

can you identify

this oil product?

Among the many new and improved materials which originate with oil is electric motor insulation. It is obtained from synthetic resins—themselves oil derivatives.

can you identify

good ROPE?

It has been said that some old-time oil men can tell New Bedford rope at a glance. Such lightning-fast identification isn't necessary. Just use New Bedford for a while—receive its benefits of utmost trustworthiness, long service life—then you'll always identify good rope as New Bedford rope. Rope shortages persist. However, New Bedford should be at your dealers. Ask for it. Meanwhile, treat the New Bedford rope you've got with care—it will repay you to do so.

3003

NEW BEDFORD CORDAGE CO.

233 BROADWAY • NEW YORK 7, N. Y.

31 St. James Ave., Boston 16, Mass. • 325 W. Huron St., Chicago, Ill.

Mills: New Bedford, Massachusetts

For PERMANENTLY Tight Joints

Particularly Effective on joints subject to Vibration, Expansion or Contraction

GARLOCK Pipe Thread Compound is a superior material developed in the Garlock laboratories for application to threaded joints of pipe lines and other equipment handling steam, water, gas, air, hot or cold oil, gasoline, kerosene or alcohol.

You can depend on GARLOCK Pipe Thread Compound to make a permanently tight joint even under difficult conditions, as it will not harden, shrink or corrode. In fact, it protects joints from corrosion, rust and "freezing."

GARLOCK Pipe Thread Compound, ready to apply as it comes from the can, is handy to use and is economical—only a thin coating is required to make a joint. Does not spoil or deteriorate if kept in stock for long periods of time. Available in 2-lb., 4-lb. tin cans and in larger containers.

THE GARLOCK PACKING COMPANY
PALMYRA, N. Y.

Tulsa, Okla. Houston, Tex.
Los Angeles, Calif.

Does Not Harden or Shrink

Keeps Joint from "Freezing"

Protects Against Rust and Corrosion

Does Not Drip

Does Not Spoil or Deteriorate

Garlock PIPE THREAD COMPOUND

test at 6487-96 feet tested dry with no bottom-hole pressure apparent.

Amite County: Gulf's J. A. Rowland Tr. "A" 2, 29-4n-2e, is drilling below 10,354 feet. After losing returns below 10,030 feet, hole was conditioned and circulation restored. No shows have been reported.

Alabama

Only 3 wildcat tests were active in the state last week. In Fayette County, Amerada Petroleum Corporation's D. H. Wright 1, NW SW 8-15s-10w, was drilling below 2786 feet.

Marengo County: George Ballio's J. L. Bedsole 2, SWc 20-13n-1e, was working at 3332 feet.

Pike County: J. W. Murphy's Alex Parks 1, 9-9n-23e, SW SE 9-9n-23e, was drilling below 2652 feet. With the exception of the Ballio test none had yet reached potential producing levels.

Crenshaw County: In the southern section of the state, Nelson Exploration Company had rigging up for Smith Lumber Company 1, NWc 26-8n-16e.

Florida

Humble Oil & Refining Company's Foremost Properties 1, NE SW 4-6s-25e, Clay County, is drilling below 5685 feet. No shows have been reported.

Franklin County: Magnolia Petroleum Company's State Block 5-B A-1, offshore test, was abandoned after reaching 7021 feet. The Tuscaloosa was extensively cored below 4717 feet to recover shale; cores taken at 6495-6515 feet recovered hard sand with streaks of shale. No shows were noted.

Palm Beach County: Humble's Tuscon Corporation 1, SWc 35-43s-40e, is running care tests below 13,330 feet. No shows have been reported.

Georgia

Two of the state's tests were abandoned last week.

Appling County: J. E. Weatherford's W. E. Bradley 1, Lot 522, Land District 2, was abandoned at 4098 feet after 8 sidewall cores recovered no shows.

Echols County: Hunt Oil Company's Superior Pine Products Company 3, Land Lot 532, Land District 13, was abandoned at 4000 feet in quartzite. No shows were indicated.

You're always ready for fishing
with this "American"
OVERSHOT
on your derrick floor!
• A SIZE AND TYPE FOR EVERY FISHING JOB!
• RUGGEDLY CONSTRUCTED!
• SIMPLE IN DESIGN
• QUICK RELEASING ACTION!
• SLIPS AND PACKER RUBBERS ALWAYS AVAILABLE!
There's no question about it . . . with this American Iron & Machine Works Co. overshot on your derrick floor . . . you KNOW you're prepared for any fishing job!
AMERICAN
IRON & MACHINE WORKS CO.
OKLAHOMA CITY, OKLAHOMA
Office, Houston, Texas
Export Office: 420 Lexington Ave., New York City, N.Y
Remember, there is an AMERICAN service man in every active field!!

• Michigan

Kimball Lake Test Is First Failure After 39 Producers

The first failure since discovery of the Kimball Lake pool after 39 producers, is Scott Drilling Company's Mitchell 2, NE NE NW 24-12n-13w, Newaygo County, on the southeast end of the play. It drilled Traverse dry at 2299 feet. It is 1320 feet east of the same operator's Mitchell 1, completed 6 weeks ago as a 1½ mile extension and responsible for most of the current drilling.

The Superior Oil Company scored its first Michigan oil producer with Pierson 1, SW NW NW 13-12n-13w, flowing 65 barrels per hour and apparently giving the company 10 to 15 locations to drill in Kimball Lake.

Crawford County: The Pure Oil Company has started stage-treatment of State 1, W½ SW NW 17-25n-4w, wildcat northwest of East Norwich field, which showed for an estimated 20 to 30 barrels of oil per day from Richfield section at 4019-410 feet.

Allowables Reduced

By emergency order issued by P. J. Hoffmaster, state director of conservation, allowables in Kimball Lake field, Newaygo County, were reduced August 4 from 100 to 75 barrels per well per day. The order can stand for 21 days without public hearing under a 1939 statute.

In issuing the order Hoffmaster said a majority of operators expressed the need for a slower withdrawal rate to avert dropping reservoir pressures and water contamination of pay section.

• Ohio

Stark County's Sandyville Field Gets West Extension

Sandyville extended west; expansion of Pittsfield continues; gas extension made at St. Clairsville; Sayre pool extended south; St. Peter test started in Ruggles.

Stark County: A test completed by Wm. Pfeiffer on Samuel Nofsinger, NE NE 6, Bethlehem township, moved the west line of the Sandyville (Canton) field ½ mile nearer the large undeveloped areas of Tuscarawas and Sugar Creek townships. A thick and regular Clinton sand at 4111-192 feet had a 4,260,000 cubic foot pay at 4160-92 feet. The well

Ready to Help.

More than 28 years of close association with the Southwest's oil industry has given the Banks of Fort Worth the experience necessary to understand its plans and ably assist in its financing. You will find, like many other oil men, that this specialized "Know How," together with adequate capital, is ready to help you with your program. The Banks of Fort Worth invite you to discuss any problems relating to oil and gas development with them at any time.

THE FIRST NATIONAL BANK

THE FORT WORTH NATIONAL BANK

CONTINENTAL NATIONAL BANK

UNION BANK AND TRUST CO.

TRINITY STATE BANK

MEMBER BANKS OF FORT WORTH CLEARING HOUSE ASSOCIATION

is to be tubed natural at a total depth of 4193 feet.

Lorain County: Another good well was completed along the west side of the Pittsfield pool by Ohio Fuel Gas Company on E. R. McConnel in Lot 105. Clinton sand at 2175-85 feet gauged 1,950,000 cubic feet natural.

Belmont County: The shallow gas pool south of St. Clairsville was extended ½ mile south by Stranges et al's Mike Adams 1, NE SE 9, Richland township. Salt sand, reached at 1089 feet, made 800,000 cubic feet in the first 2 feet. Drilling was stopped at 1091 feet and the well was tubed.

Perry County: The Sayre pool had a ½ mile extension by the Altier Bros.' Minnie Beatrice, SW SE 28, Pleasant township. Clinton sand at 3720-60 feet was dry and the Medina at 3834-41 feet made 240,000 cubic feet natural. After a 20-quart shot the well was shut in at 540,000 cubic feet.

Ashland County: E. A. Fierbaugh et al have staked Martin Clouser, Lot 24, Ruggles township, to test the St. Peter sand. A previous test 2/3 mile northwest by The Ohio Oil Company had a good showing of gas in this sand.

• Illinois Basin

Hamilton, County, Illinois, Field Receives New Horizon

Mill Shoals pool, Hamilton County, Illinois, given new horizon; 3 counties get discoveries.

Illinois

Sohio Petroleum Company's Grey 11, SE NW SE 1-7s-7e, Hamilton County, is giving the Mills Shoals pool a new horizon. The well on initial production test flowed 281 barrels of oil in 24 hours from the Rosiclare at 3352-57 feet, latter figure total depth, after 3000 gallons of acid.

Marion County: J. H. Gilliam's Ebe 1, NE NE NW 14-2n-4e, 4 miles southwest of the Xenia pool, has been completed as the discovery of the Iuka pool. The well initialed 232 barrels of oil from the St. Louis lime at 2474-78 feet. Well was bottomed at 2886 feet.

Bond County: Leo Horton's Stoecklin 1, SW SE SE 16-6n-2w, ½ mile north of the discovery well of the South Woburn pool, pumped 105 barrels of oil in 24 hours from Trenton lime at 3160-75 feet. The well is 1½ miles south of the Woburn pool.

John L. Near's Dressor 2, wildcat in S½ NE NW 21-6n-6w, has casing set for a Devonian lime test. Pipe was set at 1811 feet.

Wayne County: Puritan Drilling Company's Spicer 1, NW NW SW 24-1n-5e (formerly Aurora Gasoline Company's test) a mile west of the West Johnsonville pool, pumped 240 barrels of oil in 24 hours from Aux Vases sand at 2954-73 feet.

Gallatin County: Sohio's Lynch 1, NE NE NE 32-8s-10e, 2 miles southwest of the East Inman pool, was going on pump for production test of Aux Vases sand at 2744-49 feet. The well flowed 93 barrels of oil in 5 hours and then flowed 63 barrels in 6 hours after acid treatment.

Marion County: Ben J. Taylor's Sebastian 1, NW NE SW 21-1n-2e, was pump-testing Benoist sand at 1917-31 feet after swabbing a barrel of oil and 3 barrels of water hourly.

• California

Oil Discovery Made a Mile Northwest of Athens Field

Oil discovery made 1 mile northwest of Athens field in Los Angeles County; minor oil discovery in schist conglomerate reported in Lawndale well; new deep zone or zones established in Del Valle field as test flows 36-gravity oil by heads; wildcat to be drilled 1 mile east of downtown Los Angeles; Kettleman Hills South Dome wildcat will be Eocene test to 12,000 feet; state's deepest wildcat south of Bakersfield nears 15,000 feet.

Los Angeles County: Shell Oil Company has made an oil discovery about 1 mile northwest of the Athens field and just outside the Los Angeles city limits on the southeast. Union-Poindexter 1 in 12-3s-14w, was pumping 122 barrels a day of 30.7-gravity oil, 3.7 percent cut, and 60,000 cubic feet of gas. Water cut, which was fairly large during tests, had almost been eliminated. Total depth is 9272 feet with plug at 8642 feet. The oil is from a formation in the Miocene, much deeper than any of the productive sands in the Athens-Rosecrans field, which definitely identifies the well as a field discovery rather than an outpost. It was drilled on property leased from Union Oil Company, which has only a landowner's royalty interest. Exact location is 1267 feet south and 1103 feet east from the intersection of Imperial Boulevard and Western Avenue.

Seaboard Oil Company is believed to have made a small discovery in fractured schist at Johnson 1, Lawndale area, 17-3s-14w. Company has been unusualy close-mouthed about the well, but a string of casing was set and a location has been staked for a second well, Johnson 2, about 630 feet south and 230 feet west of the first well.

R. E. Havenstrite, Operator, has definitely established the existence of a deeper zone or zones below the Bering zone, until now the deepest producing horizon in the Del Valle field. Operator's Lincoln 15 was flowing by heads at rates varying from 100 to 500 barrels of 36-gravity oil, 20 percent mud and emulsion, from open interval at 19,933-11,762 feet. Average depth of wells in the Bering zone, also discovered by Havenstrite, is 8550 feet.

Richfield Oil Corporation has staked Los Angeles River Community 1, a wildcat within the city limits of Los Angeles and about 1 mile east of the downtown district. Location is about 2½ miles west of a dry hole drilled in the city's Boyle Heights area last year by the same company.

Kern County: Standard Oil Company of California stated that its San Francisco and Fresno Land 4-2 wildcat on the South Dome of Kettleman Hills in 12-25s-19e will be an Eocene test to around 12,000 feet. This will be the first Eocene test on the South Dome.

The Superior Oil Company and Independent Exploration Company will drill KCL-A 57-13, a joint wildcat in 13-29s-27e, about 1 mile northeast of the Fruitvale field.

Superior also has made location for USL 1, an outpost test in 18-26s-21e about ½ mile east of the north end of the Lost Hills field.

Western Gulf Oil Corporation will drill Tejon Ranch 1, a wildcat, 3 miles northeast of production in the Tejon field in 29-11n-18w.

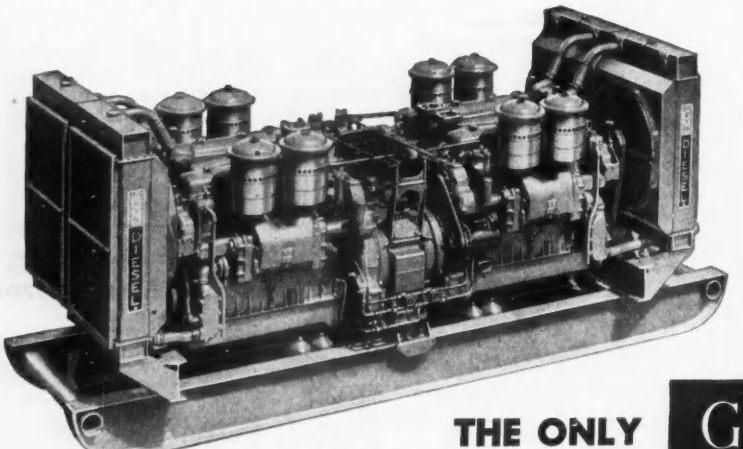
The Texas Company's latest completion in the Belgian Anticline area near the town of McKittrick indicates the company's discovery here last year may be of substantial proportions. Westpet NCT One 57-29 in 29-30s-22e was completed flowing 218 barrels of 36.4-gravity oil, 2 percent cut, through 10/64-inch choke with 1100 pounds pressure on tubing and 1200 pounds on casing.

Deepest wildcat in the State is Western Gulf Oil Company's S.P. 1, in 25-12n-20w, 15 miles south of Bakersfield, which is drilling just above 15,000 feet.

Butte County: General Petroleum Corporation will drill a second wildcat in the Willows area. Location has been made for Llano Seco 2, 1 mile north of Llano Seco 1 in 28-20n-1w, which was abandoned. The latter well was drilled to 8306 feet, but stuck drill pipe caused abandonment. Reports in the field were that the operator's objective is production in rocks of Cretaceous age.

Tax Rate Set

A 35-cent increase in the state ad valorem tax rate for the fiscal year ending June 30, 1948, was set by the Texas Automatic Tax Board. The new rate is 72 cents per $100 valuation. The board, composed of Governor Beauford Jester, Comptroller George Sheppard and Treasurer Jesse James, voted to re-levy the 35-cent tax for general revenue fund purposes, which was not collected last year.



THE ONLY REALLY PORTABLE AND FLEXIBLE 600 HP DIESEL ENGINE

GM "QUAD"

Any number, or all, of the four engines of a GM "Quad" can be operated, depending upon the power requirements. It is even possible to remove one engine from a "Quad" unit, and take it into a shop for repair while the other three could still be operating. Each engine of a "Quad" is controlled by an individual clutch and throttle.

This series of engines is built from a two-cylinder to a twenty-four cylinder unit, with all of the wearing parts, such as pistons, valves, and bearings interchangeable, thus simplifying the maintenance problem of drilling engines. Quads can easily be coupled-up to the conventional compound mechanism of a drawworks.

The Portability of a GM "Quad" makes it highly adaptable to all types of marine drilling operations.

GEORGE ENGINE CO.

MAIN PLANT
1111
Jefferson Hwy.
New Orleans, La.

LAKE CHARLES BRANCH
512 Railroad Ave.
H. F. COLBY
Manager

• Rocky Mountain Area

Quealy Dome Field, Wyoming, Has Second Tensleep Producer

Quealy Dome field, Wyoming, has second Tensleep producer; Pilot Butte southeast extension try quits; Madison yields saturation in Elk Basin test; Yellowjacket structure test on east side of Uintah Basin, Colorado, is failure.

Wyoming

The California Company has completed the second Tensleep producer in the Quealy Dome field, west of Laramie. The well is Wilson 5, CWL SW 18-17n-76w, Albany County, and ½ mile east of the Tensleep discovery completed in January for 250 barrels of oil daily. The new completion topped the Tensleep at 5318 feet, 100 feet higher than the discovery, and was producing at the rate of 510 barrels of oil daily on pump. Tensleep oil from this field is moved by truck to the Frontier Refinery at Cheyenne.

Five miles northwest of Quealy at Seven Mile The California Company and Phillips Petroleum Company have found water in the top of the Nugget sand at 6625 feet but were continuing to drill in that formation at Christiana 1, NE NE SE 8-17n-77w. Principle objective of the well was the Nugget and the well will be drilled to the base of the sand before the operators decide whether to continue another 2000 feet to the Tensleep. Muddy sand at 5821-33 feet made 940 feet of clean oil on drill-stem test and the well may be plugged back to this horizon for further testing.

Fremont County: An attempted southeast extension at Pilot Butte field failed to find production in sands down to the Morrison and the well has been abandoned. The Superior Oil Company drilled the extension try at Kimball Community 1, NW SE NE 27-3n-1w, and topped Muddy at 4012 feet and Morrison at 4537 feet. Both sands tested water. The well was based on faulting between the location and the field proper.

Park County: Stanolind Oil & Gas Company, as unit operator for the Elk Basin field, has made a drill-stem test of Well 95-M, NE NW SE 31-58n-99w, the second Madison deepening in the field. The well flowed at the end of 53 minutes on test at 5206-55 feet and apparently found good saturation in this zone. Madison was topped at 5029 feet and the entire section of more than 700 feet probably will be drilled, if water is not encountered, before the well is completed. Last winter the first Madison test on top of the structure was drilled by Stanolind and completed in the lower section of the lime for approximately 250 barrels of oil daily. The new well is 2 miles south of the Madison discovery well.

The Carter Oil Company's extension at Watson 8, NE SE SW 8-57n-99w, 1½ miles south of the new Stanolind Madison test, is now drilling below 2000 feet. This well is just outside the unit participating area for the field and may be deepened to the Madison if production is not found in the Tensleep. Inasmuch as no definition of productive areas has been established for the Madison zone and the Carter location is apparently on the east side of a fault, structural conditions may be similar to

Calling the Caboose on a Santa Fe Freight Train

Radio Telephone Communication helps eliminate delays in shipping freight

THE ENGINEER IN HIS CAB has a dual check—vocal and visual—on his instructions. Radio equipment includes a telephone handset, loudspeaker, low-powered transmitter, receiver and power supply in both cab and caboose.

During the war, an ultra-high frequency 2-way radio system enabled a pilot to communicate with his base or aircraft carrier.

This same type radio system is being installed on Santa Fe freight trains to provide a means of direct voice communication between engineer in cab and conductor in caboose, and between yardmaster and switching crews.

Better Service

It means more expeditious handling of trains. Conductors can give "emergency stop orders" without setting of the emergency brakes and the risk of a break-in-two of the train and resultant delay.

For instance, a stop to check a suspected "hot box" or other defect needing attention can be handled in three to five minutes instead of twenty to thirty minutes.

Another Reason for "Santa Fe—all the way"

This is only one of the many improvements Santa Fe is installing to expedite yard service and freight handling. It's another reason for "Santa Fe—all the way" that is helping to provide better "on-time" handling of your freight shipments.

THE FREIGHT CONDUCTOR IN THE CABOOSE calls the engineer in the cab. Transmission in all weather over desert and mountains and under bridges and power lines is highly satisfactory.

Santa Fe

SANTA FE SYSTEM LINES

Serving the West and Southwest

WORLD OIL'S Trading Post

CLASSIFIED ADS

SERVICES · PERSONNEL · USED EQUIPMENT

Rates: Regular classified (undisplayed) set in this size type: 7 cents per word for first insertion and 5 cents per word for each succeeding insertion for same copy. Displayed advertisements, set in suitably larger type with ruled border, $5 per inch for first insertion and $4 per inch for succeeding insertions same copy. All classified ads payable in advance. Send copy and checks to: Trading Post Section, World Oil, P. O. Box 2608, Houston, Texas.

FOR SALE

■ FOR SALE—Model 55 Wichita Spudder less mast with PA-100 International engine in good condition. Located close to Pampa, Texas. Nabob Oil & Gas Company, Box 448, Amarillo, Texas.

POWER ROTARY RIG

■ Wilson Mogul, 96-ft. derrick complete tools and equipment, 3200-ft. 3½ drill pipe, core barrels, drill collars, extra supplies, bits and parts. Now drilling at 3100 feet; well near completion. 1940 International Winch derrick truck and pipe dolly, everything complete to contract drilling oil and deep water wells. Good order and ready to go on new job. For sale as is on present location at a bargain, located in Toombs County, Ga. Price $14,000.00 Complete and ready to go. T. R. Davis, 700 Mosley St., Vidalia, Ga.

Calco's — Armco — Portable — Pipe
RAINMAKER IRRIGATION SYSTEMS
For Crops, Orchards, Pasture and Truck Farming — Shipment Within 30 Days.
DRILLERS PORTABLE WATER LINES
Quick Coupling — 120 lbs. Pressure
C. E. PLOTT (Irrigation)
513 Petroleum Bldg. Chickasha, Okla.

FOR SALE

■ For Sale: Excellent casing pulling machine. Good condition, ready to go. Eight cylinder hdyraulic pump. 7" hydraulic jacks. 47' relegged 7" mast and substructure. Will sell complete for $4000.00. Address: Box 81W, c/o World Oil, Houston, Texas.

SHOT HOLE DRILLS
Large and Small

All are truck mounted, rotary, chain pull down, smallest pump size 4x6. Some are in excellent condition; others need repair. Price F.O.B. Dallas, from $3,000 to $8,000 including truck. For details write 8800 Lemmon Avenue, Dallas, Texas.

FOR SALE EQUIPMENT FOR SALE

4—100 HP Bessemer type 8 gas engine direct connected to 16½ x 20 compressor	$1,550.00 Each
1—80 HP Clark engine direct connected to two stage compressor	1,750.00
2—80 HP Clark, hubble head, direct connected to 16 x 20 power cylinder, 18 x 20 compressor cylinder	1,750.00 Each
3—Ingersoll-Rand No. 10 type, twin cylinder air compressor	250.00
Belt Driven By	
3—90 HP Superior twin cylinder gas engines	500.00 Each
1—10½ x 12 Type 10 Ingersoll-Rand Imperial air compressor	250.00
1—5½ x 12 Type 10 Ingersoll-Rand Imperial air compressor	250.00
1—Braun cooling tower	2,500.00
1—Braun combined bubble still and rectifier	500.00
1—40" x 32' Braun absorber	650.00
1—5' x 36' High bubble type absorber	750.00
2—150 HP tubular boilers w/insulation, furnace and smoke stacks	500.00 Each
2—70 HP oil field boilers	250.00 Each
3—5—2 Stage Fig. 3300 Gould Cent. belt driven pumps	100.00 Each
3—4 Single stage Fig. 3031 Gould Cent. belt driven pumps	100.00 Each
1—Small machine shop tools consisting of: 1—6 HP F&M gasoline engine; 1—21" Canaby-Otto drill press; 1—50 Ton Hyd. press w/½ HP motor; 1—16" John Styta shaper machine; 1—1 HP motor w/Emery wheel; 1—16" Cincinnati lathe	$800.00

P. O. BOX 220 **RANGER, TEXAS**

FOR SALE

FOR SALE

GENERATING UNIT equipped with 4 Cylinder, 4 Cycle, Model T-137, Type ES-4 Clark Gas Engine, directly connected to Electric Machinery Company Alternator, 3 Phase, 60 Cycle AC, 75 KVA, 60 KW, 80% PF, 480 Volts, 90 Amps, 400 RPM.

Exciter—3½ KW, 125 Volts, 28 Amps.

Electric Machinery Company Switchboard equipped with AC Volt Meter, AC Ammeter, DC Ammeter, AC Frequency Meter, switches, etc.

Circulating System by Happy-Young Radiator Company. Full Flow Engine Jacket Cooler.

All motor driven. Building included.

This plant has been completely overhauled. New cylinders, pistons, pins, etc. Can be seen and run and load put on it for inspection. Operates like new.

You may contact Dalport Oil Corporation, 1304 Magnolia Building, Dallas, Texas, or George G. Todd, 507 West Storey Street, Midland, Texas, Telephone 2447-W.

LEASES, DRILLING, ACREAGE, ETC.

■ SEE A. L. BOWLES, ADA, OKLAHOMA FOR SHALLOW DRILLING DEALS IN OKLAHOMA.

LEASE OR DRILLING DEAL

1200 acres solid block on structure, shallow Trenton Lime Production, 800 to 1200 feet. Semi proven gas well on one end, have geologist maps and U.S.G. Survey. Located in Clinton County, Ky. Cheap drilling. Want drilling deal or sell for cash. A number of high gravity wells brought in in this county in past two years, good for 10 to 100 barrels an hour. T. R. DAVIS, 700 Mosley St., VIDALIA, GA.

FOR SALE—6x6x6x12 Ingersoll Rand Compressor & 80 HP Bessemer Engine including belts, connections, coils, corrugated iron bldg., etc. Excellent condition. Near Bartlesville. Price $1650. Write 45 Oil Co., Bartlesville, Oklahoma.

GEORGIA DRILLING AND LEASE DEAL

Have Rotary Well drilling on large drilling Block in Toombs County, Ga., on a Gravity surveyed high. Well down 3100 ft., and out of drill pipe. Also need financial help to complete. Have had good oil and gas shows and made one drill stem test at 2521 ft., best prospects for production from here to basement. Open deal for right party to invest $5,000.00 to carry this well on down, and take an interest in the well and acreage. Over twelve million acres under lease in South Georgia to Major Oil Companies and prospecting has really started. Georgia may be our next big oil state! Think it over. T. R. Davis, 700 Mosley St., Vidalia, Ga.

INVESTMENTS

■ **If you have a million dollars or more which is not helping to secure the future of these United States, and which is not earning a reasonable return, and if you still have faith in our country, and do not always believe that it is headed for the rocks, in short that you are not a prophet of "DOOM," get in touch with us at 731 Public Ledger Bldg., Philadelphia 6, Pa., we possibly could do business together.**

SITUATIONS WANTED

■ GEOLOGIST, twenty years experience in Gulf Coast exploration and development desires change. Surface, subsurface, and paleontological training and experience. Now employed by major company. Not available until after Jan. 1st. Minimum salary $650. Address: Box 78W, c/o World Oil, Houston, Texas.

■ LANDMAN, thoroughly experienced in all phases land work. Eight years with major oil company, last five years with large independent. At present and for last two years District Landman. Desire change. Available on month's notice. Address: Box 82W, c/o World Oil, Housotn, Texas.

HELP WANTED

■ Sales Engineer wanted for Stainless Steel and other Steel products, contacting fabricating, chemical and refinery plants in Texas and Louisiana, working out of Houston. Prefer Houston resident. Man selected will be chosen on the basis of ambition, aggressiveness and ability to assume responsibility. Engineering and metal background preferred but not necessary, with contacts in the above area and fields desirable. Age 25-35, salary open with expenses and car furnished. Forward employment summary, picture, trade and personal references to: Box 83W, c/o World Oil, Houston, Texas.

WANTED: LAND DEPARTMENT SCOUT. Must have good qualifications with reference to education and integrity. Prefer someone who has some education in geology and petroleum engineering and some experience in scouting. Chance for advancement in Land Department work. Address: Box 75W, c/o World Oil, Houston, Texas.

PETROLEUM ENGINEER
Experienced graduate Petroleum Engineer by large major oil company operating in Mid-Continent and Southwest area. Should be a specialist in well completion practices. Wanted to take charge of well completion work in major oil field. Good salary and house furnished. Please reply giving all particulars. Box 77W, c/o World Oil, Houston, Texas.

MAPS

PERMIAN BASIN EXECUTIVES MAP
1947 EDITION
Shows sections, surveys, wells, dry holes, and depths in blue; field names, formation depth, discovery year, number wells in red; larger lease blocks, expiration year in green. 1-in. —5 mi. 3 x 4 ft. Illustrated folder on request.
PRICE $7.50
SOUTHWEST MAPPING COMPANY
1101 Ft. Worth Nat'l Bldg..
Ft. Worth, Texas

Read

The Trading Post

For Sales and Service

those established by the Sinclair Wyoming Oil Company wildcat on the northwest side of the Elk Basin field. The Sinclair well is now testing production in the Madison.

Colorado

At East Powder Wash, Cities Service Oil Company and Transcal have shut down for orders their wildcat at Government 1, SE SE NW 27-12n-96w, Moffat County. The well is at 5473 feet, total depth, and may be deepened another 1000 feet before completion. On drill-stem test at 5461-73 feet the well made only 40 feet of oil-cut mud in 45 minutes. A sand at 3747-3813 feet showed well on electrical log but has not been tested. In the event the well is not deepened, casing probably will be run and this zone tested through perforations. The majority of lenticular Wasatch (Tertiary) sands that produce at Powder Wash field proper, 8 miles west of the wildcat, were shaled out at East Powder Wash.

Rio Blanco County: Phillips was abandoning its wildcat of the Yellowjacket structure on the east side of the Uintah Basin of Colorado. The well is Unit 1, NW SE SW 1-1n-92w, and was drilled to 5065 feet, total depth, probably in Cambrian. Although the well was higher structurally than a well drilled on the structure several years ago, no shows of oil or gas were encountered.

Utah

Official release of information by Mountain Fuel Supply Company on its Weber sand test at Clay Basin at Murphy 6-W, NW SE NW 22-3n-24e, Daggett County, gave top of the Weber at 9025 feet, and on drill-stem test 9057-297 feet the well made a maximum of 6,301,000 cubic feet of non-inflammable sour gas with some sulfur water. On test at 9301-55 feet, total depth, the well made sulfur water with a slight show of gas. An anlysis of the gas showed 81.10 percent nitrogen. This test was plugged back to Dakota and completed for 5,210,000 cubic feet of sweet gas daily. The well was the first test to Weber in the field, which has produced gas from Frontier and Dakota sands since discovery in 1930.

Big Horn Map Issued

A new geologic and physiographic map of the Big Horn Basin of Wyoming and Montana, covering about 7500 square miles, has been issued by the Geological Survey. Copies of the map, issued as Preliminary Map 71 of the Oil and Gas Investigations series, were placed on sale at 50 cents each last week at the Survey offices in Washington, Casper, Wyo.; Tulsa, Denver and Billings, Mont.

• Canada

Imperial Oil Scores Seventh Success in Central Alberta

Imperial Oil, Ltd., hoisted its score at Leduc to 7 straight successes in a week which sharply altered the picture in this new Central Alberta Devonian oil field. The latest Imperial successes, Nos. 6 and 7, are ¼-mile offsets to the Nos. 2 and 4 D-3 zone producers. On drill-stem test, both flowed oil through 4½-inch drill pipe within ½ hour from the D3 zone after tester was opened, indicating open flow potentials of 1000 barrels daily or better, comparable to those of the first 5 completions. No. 6 is bottomed at 5359 feet and No. 7 at 5397 feet.

Of the seven producers, two are yielding from the D2 zone, and five from the D3, which is about 150 feet below D2's base. The adjoining Imperial Nos. 1 and 5, the D2 producers, did not drill to D3. Nos. 2, 3, 4 and 6 found D2 porosity poorly developed and got no recovery on drill-stem tests. No. 7, which offsets No. 2 on the southwest flank of the structure, found better porosity in D2, but obtained some salt water with the oil and gas on drill-stem test to establish the water line in that zone. It then went on to success in D3.

Globe-Leduc West 2, 1¼ miles northwest of Imperial's most northerly producer (No. 3), found the D2 zone 25 feet lower in elevation than at the high-logging Imperial 3, and pulled a surprise when it encountered fairly well-developed porosity. A drill-stem test at 4890-4940 feet, in the middle of the D2 section, gave a 500 Mcf gas flow and a 660-foot rise (120 feet of mud, 540 feet of clean oil) in 1 hour. Last week it was to test a 40-foot section of D2, to 4980 feet. It is expected that this well will then go on to D3, with good prospects of becoming the field's first 2-zone producer.

Okalta-Leduc 1, 2½ miles southeast of the currently proven area, and 3 miles due east of Imperial 7, has found only water plus a little gas in the D2 zone. Top of D2 came at 5000 feet at an elevation comparable with Imperial's deep Nos. 2 and 7, but a test at 5005-37 feet gave up a gas flow of 100 Mcf plus a 3870-foot rise of salt water in 1 hour. Drilling was proceeding below 5200 feet, heading for D3. In view of the result at Imperial 7, some hope is held for D3 production.

McColl Frontenac Oil Company, The Texas Company affiliate, has abandoned its East Wetaskiwin wildcat, 30 miles southeast of the Leduc field. Drilled to 5368 feet, the well found some oil and gas shows in slight porosity in the D1 zone of the Devonian, but D2 and D3 sections were tight and unproductive. The company's Wizard Lake and Bigstone Creek wildcats are drilling in the Devonian, looking for D2 zone. Rig from East Wetaskiwin will go to a new wildcat, whose location will be announced in the immediate future.

McColl Frontenac Oil Company and Union Oil Company of California have followed up their month-old natural gas discovery at Manyberries, Southeast Alberta Plains, with a 19,000 Mcf open flow potential at McColl-Union 7C-6-5-5, 2 miles south and a mile east of the discovery.

The discovery rates 30,000 Mcf from Bow Island sand section at 2519-30 feet. The followup was successful in the Bow Island sand from 2558-70 feet. The Manyberries gas field is 14 miles east of the McColl-Union Pakowki gas field, discovered in 1946, and is 40 miles south of the large Medicine Hat gas field, Alberta's first. McColl and Union have now started 2 more wildcats, 1 about midway between the Manyberries and Pakowki fields, the other about 3 miles northwest of the Manyberries discovery.

EXPLORATORY FAILURES

ARKANSAS WILDCAT

Union County: J. G. Sutton Oil Co.'s Rushing 1, c sw sw nw 20-17s-13w, se Champagnolle fld, Meakin sd 3600, abnd 7-26-47 at 3550.

CALIFORNIA WILDCATS

Fresno County: Porter-Sesnon et al, Chevalier 1, 12-21s-14e, W Coalinga area, abnd 7-28-47 at 1447.

Kings County—Failure: C.C.M.O. Co.'s Orchard 1, 25-24s-17e, McLure Valley area, abnd 7-28-47 at 2503.

Butte County—Failure: General Pet Corp.'s Llano Seco 1, 33-20n-1w, Willows area, abnd 7-26-47 at 8306.

Yolo County — Failure: Shell's Meridian Unit 1-1, 5-9n-1e, Meridian area, abnd 7-28-47 at 5200.

Los Angeles County—Failure: Union Oil Co.'s Simi 9, 18-3n-17w, Simi area, abnd 7-30-47 at 3936.

COLORADO WILDCAT

Huerfano County: S. W. Pressey's Pressey 1-X, nw ne sw 3-27s-67w, Alamo-St. Mary area, Dakota 3215, abnd 7-25-47 at 3215.

GEORGIA WILDCATS

Appling County: J. E. Weatherford's W. E. Bradley 1, sec lot 522, Land Dist. 2, abnd 7-30-47 at 4098.

Echols County: Hunt's Superior Pine Prod. Co. 3, swc Lot 532, Land Dist. 13, abnd 7-29-47 at 4000.

ILLINOIS WILDCATS

Coles County: Harold C. Sanders et al's Childress 1, sw 30-13n-11e, abnd 350.

Edwards County: C. E. Skiles et al's Mode 1, se se ne 32-2s-14w, abnd 3143.

Effingham County: Nat. Assoc. Pet. Co.'s Kohnert 2, 18-7n-6e, abnd 2550.

J. V. Dunbar's Diebel 1, nw sw sw 13-7n-7e, abnd. 2964.

Fayette County: Paul Doran's Ragel 1, sw se sw 17-6n-3e, abnd 1958.

Marion County: Nash Redwine's Conant 1, sw sw se 24-4n-2e, abnd 1779.

Richland County: Peter Garasimos' Williams 1, sw 9-3n-11w, abnd 3262.

Wabash County: Joe Reznik's Summers 1, sw ne nw 4-1s-13w, abnd 2750.

KANSAS WILDCATS

Barber County: Champlin Ref. Co.'s Storm 1, ne se ne 12-33s-14w, abnd 5332.

Barton County: Stanolind's Baker 1-B, nw se ne 19-20s-14w, abnd 3735.

Cowley County: McNeish & Gralapp's Doane 1, ne ne nw 36-33s-6e, abnd 2800.

Rice County: Three-Way Drlg. Co.'s Heckel 1, swc 23-21s-10w, abnd 3506.

Rooks County: Stanolind's Stamper 1, se se ne 6-8s-17w, abnd 3385.

Nate Appleman's Scharndt 1, sw sw se 25-9s-18w, abnd 3678.

KENTUCKY WILDCAT

Henderson County: R. Compton's Royster 1, 21-Q-25, abnd 2286.

NORTH LOUISIANA WILDCATS

Caddo Parish: Chas. H. Murphy, Jr.'s Wm. C. Agurs 1, 660 fr n&wl frac sect 7-16n-16w, Massive Anhydrite 4548-4833, Travis Peak 6012, abnd 7-18-47 at 6503.

DeSoto Parish: Texas Co.'s E. J. Miller 1, 2542 fr sl 1542 fr wl 9-12n-14w, core test on Grande Cane Prospect, abnd 7-24-47 at 1630.

Texas Co.'s La. Ld. & Inv. Co. 1, 813 fr sl 1717 fr wl 15-12n-14w, core test on Grand Cane Prospect, abnd 7-23-47 at 1565.

Texas Co.'s May Huson 1, 1163 fr nl 3284 fr el 17-12n-14w, core test on Grandcane Prospect, abnd 7-19-47 at 1630.

Morehouse Parish: Angle & Crain's E. M. Clark 1, 672 fr sl 515 fr wl 2-20n-7e, Midway 2080-2100, Gas Rock 2550-55, base Gas Rock 2590-2600, Cotton Valley 3115, abnd 7-25-47 at 4036.

Union of Calif.'s D. W. Pipes 1, 330 fr n&wl ne 19-19n-6e, abnd 7-22-47 at 2977.

Richland Parish: Fred Kalel's Greer 1, sw nw 25-17n-7e, Chalk 2710, abnd 7-27-47 at 3520.

Geo. B. Franklin's Jesse E. Cochran 1, nw nw 10-17n-8e, abnd 7-20-47 at 3007.

L. W. Dennis, Jr. et al's John L. Tatum 1, nw sw 18-17n-9e, 1 mi n Delhi prod, abnd 7-22-47 at 4408.

Union Parish: R. T. Sellars-Wilson Ewing's Monzingo Rivers 5, 990 fr sl 1654 fr wl 19-22n-1e, e of Ora fld, abnd 7-22-47 at 2488.

Fletcher & Sneed's R. F. Ward 1, c ne se nw 30-22n-1w, 4 mi w Ora fld, abnd 7-24-47 at 2533.

MICHIGAN WILDCATS

Allegan County: Wadsworth & Cook's Hupp 1, nw ne ne 22-4n-11w, Traverse 1878, abnd 7-28-47 at 1883.

Roscommon County: Sun's Douglass 1, s½ sw nw 24-23n-2w, abnd 7-30-47 at 5015.

MISSISSIPPI WILDCAT

Smith County: Danciger's Smith County Oil Co. 1, nw sw 2-1n-7e, Wilcox 2057, Eutaw 6516, Tuscaloosa 7015, Massive sd 8167, Comanchean 8247, abnd 7-24-47 at 8407.

NEW MEXICO WILDCAT

Socorro County: Forrest B. White-G. T. Mangel's State 1, nw nw nw 32-4n-3w, elev 6200, granite wash 172, sand 187, abnd 7-23-47 in granite at 201.

OKLAHOMA WILDCATS

Cotton County: Nixon Pet. Co.'s Young 1, ne ne se 9-5s-12w, abnd 2110.

Creek County: Edward P. Baker's McCreary 1, ne nw sw 11-18n-9e, abnd 3103.

Hughes County: Republic Nat. Gas Co.'s Harrod 2, sw sw ne 7-8n-10e, abnd 280.

Lincoln County: Mid-Continent's School Land 1, sw sw nw 36-13n-6e, abnd 4325.

Logan County: Eason Oil Co.'s Col 1, c nw nw 16-15n-1w, abnd 6075.

Noble County: Peppers Ref. Co. et al's Haschler 1, se se ne 5-22n-1w, abnd 4848.

Pottawatomie County: Harper & Turner et al's Stasta 1, se se nw 17-11n-5e, abnd 4960.

Stephens County: Jackson Drlg. Co.'s Reck 1, sw ne sw 32-2s-6w, abnd 2553.

Ace Gutowsky's Brooks 1, sw se sw 18-2s-6w, abnd 2904.

TEXAS PANHANDLE WILDCAT

Hale County: Southern Minerals Corps.'s Heard 1, c sw sw E.L. & RR 13, blk R, elev 3326, San Andres 2700, 4063, Tubb 5080, abnd 7-23-47 at 7210.

SOUTH CENTRAL TEXAS WILDCAT

Atascosa County: Pegg Bros.' Suzanna Pratt 1, 3400 fr nwl 4200 fr swl F. de la Garza Sur, abnd 7-31-47 at 2373.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Nueces County: Southern Minerals Corp.'s W. E. Baxter 1, 467 fr n&wl at ra of blk 13, sbdn of John J. Elligg tr, in nwc sbdn in J. V. L. de Herrera Gr on 440-ac lse, 1¼ mi sw E. Riverside fld, abnd 7-27-47 at 7202.

Zapata County: Texon Drlg. Co.'s Encarnacion G. de Ramos 1, 467 se of nwl Porc 16, 478-ac lse, sh A-1, abnd 7-20-47 at 3055.

MIDDLE TEXAS COAST WILDCAT

Refugio County: Ginther, Warren & Ginther's Mary Riester Vincent et al 1, 2403 s alg wl fr nwc Vincent et al tr the 1650 e at ra in C.C. Irr. & Mfg. Co. sur, abnd 8-2-47 at 6255.

UPPER TEXAS COAST WILDCATS

Chambers County: Warren Wright's Moss Est. 1, 1700 fr nel 330 fr se; 600-ac lse, insely portion of Booth sur, abnd 7-28-47 at 9205.

Ft. Bend County: Humble's Bankers Mortgage Co. 1-D, 467 at ra fre el 330 at ra fr sl lot 15, on line between lots 14-15, ¾ mi sw Sugarland flk prod, abnd 7-23-47 at 7504.

Liberty County: Wm. H. Hunt, Tr. Est.'s B. H. Simmons et al 1, 330 fr nl 1320 fr wl sect 109 H&TC Sur, and 110-ac lse, abnd 7-23-47 at 9947.

Wharton County: Johnston & Johnston's J. L. Myatt 1, 1700 fr wl 420 fr sl Jos. Hyland Sur, 1½ mi s of extr w side prod at Withers, abnd 7-27-47 at 5825.

WYOMING WILDCAT

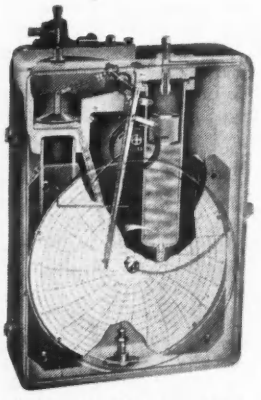
Big Horn County: Paint Rock Dev.'s Hogan 1, c nw se 12-49n-91w, Paint Rock area, Tensleep 1770, Amsden 1912, abnd 7-24-47 at 2205.

WYOMING OUTPOST

Fremont County—Pilot Butte: Superior's Kimball Community 1, nw se ne 27-3n-1w (WRM), Muddy 4012, Dakota 4263, Morrison 4460, abnd 7-29-47 at 4579.

SIMPLIFIED SERVICING

AND CONVERTING OF PRESSURE RANGES



THOUSANDS of American Meter Company's METRIC Orifice Meters based on the famous Westcott Manometer are making year-in-year-out records of sustained accuracy in the petroleum producing and refining fields.

Their simplicity of inspecting, cleaning and adjusting make them the outstanding choice of field engineers. METRIC Orifice Meters are equally outstanding for refineries and continuous processing because they may be readily converted from one operation to another. Pressure ranges can be easily changed without disconnecting gage lines.

Technical literature, giving complete data, will be mailed on request. Also information on the Round Case Flowmeters, Liquid Level and Flow Controllers.

AMERICAN METER COMPANY

INCORPORATED ESTABLISHED 1874

Albany • Atlanta • Baltimore • Birmingham • Boston
Chicago • Dallas • Denver • Erie • Houston • Joliet
Kansas City • Los Angeles • New York • Orlando
Philadelphia • Pittsburgh • San Francisco • Tulsa

Recycling Plant Approved

Permission to operate a recycling and processing plant in the Pinehurst Field, Montgomery County, was granted the Gray Wolfe Company by order of the Texas Railroad Commission. Production in the field is from six sands of the Wilcox section—the Pan Am, Grogan, Cochran, Mostyn, Winslow and Posey.

S. W. Selfridge has been named assistant treasurer and tax agent for Standard Oil Company of California. Selfridge was formerly assistant manager of the company's real estate and right-of-way department. He succeeds the late **Rudolph Miller,** tax agent since 1934. Selfridge started with Standard in 1922 and became a right-of-way agent for the company in Los Angeles in 1923. In 1937 he was made manager of Standard's right-of-way department, and on that department's consolidation with real estate activities, became assistant manager of the new department.

S. W. Selfridge

»

J. L. Cooley has been named vice president and director of California's Research Corporation, Standard Oil Company of California subsidiary. He will be responsible for research on fuels and special products. Announcement also was made of changes in the responsibilities of two other vice presidents. **W. N. Davis** will supervise research on lubricating products and **L. P. Elliott** will handle process research and engineering.

»

Dr. Sherman A. Wengerd has resigned as subsurface geologist for Shell Oil Company in the North Texas Division, to become an assistant professor in geology at The University of New Mexico.

»

W. D. Inskeep, drilling contractor, has been named contract agent for Crissman Drilling Company with offices at 615 East Willow Street, Long Beach 6, Calif.

»

Pete W. Cawthon, Jr., of Tuscaloosa, Ala., has been appointed to hold the Stanolind Oil & Gas Company graduate fellowship in petroleum engineering for academic year 1947-48, it was announced from the College of Engineering at the University of Oklahoma. The Stanolind fellowship, established in 1946, is for graduate work in petroleum engineering in the study of the displacement of fluids from reservoirs.

»

James C. Martell, formerly civilian chief of the Petroleum Requirements Section of the Fuel Division in Washington, D. C., has joined Coastal Oil Company, Newark, N. J., as assistant to **President Wiley H. Butler.**

»

Paul Cavins, general manager of the Cavins Company, is recuperating in Seaside Memorial Hospital, Long Beach, Calif., after an operation.

»

Clayton Wallace has become Michigan production foreman for The Carter Oil Company, succeeding C. H. Evans, who has been transferred to the St. Elmo, Ill., district.

William Palmer of Grand Rapids has been named executive secretary of the Oil & Gas Association of Michigan and secretary of the Petroleum Industries Committee, effective October 1. Palmer has been secretary of the West Michigan Tourist and Resort Bureau since 1943. He was secretary of the Michigan Petroleum Industries Committee for six years prior to taking his present post. **Harold M. McClure** of Alma, independent oil producer and president last year of the National Stripper Well Association, has served as legislative secretary of the association since 1941. He plans to resign to devote greater time to his own oil enterprises. **Arthur H. Ledbetter,** business secretary of the association the past two years with offices in Mt. Pleasant, will continue in his present position.

»

Warren Beebe, vice president and chief geologist with Bay Petroleum Corporation of Denver, has resigned, effective August 15, to accept a position with Anderson-Prichard Oil Corporation at Oklahoma City. **E. L. Birmingham, Jr.,** division manager for Bay at Wichita, will move to Denver to replace Beebe, and **C. L. McCown** has been promoted to division manager of the Mid-Continent area for Bay.

»

T. O. Criswell, scout for The Carter Oil Company at Denver, is being transferred to Montana with headquarters at Billings.

»

J. M. Clark is resigning, effective August 15, as Oklahoma district geologist for Tide Water Associated Oil Company and will enter the consulting field. His office will be located temporarily at his residence, 602 South Erie, Tulsa.

»

D. E. White has been chosen superintendent of maintenance for Magnolia Pipe Line Company and **C. R. McKinney** was chosen assistant superintendent of maintenance in Central Texas, West Texas and the northern division. C. B. Swanner, Dallas, has become assistant manager of the safety department and H. W. Simmons will succeed him as divisional safety supervisor in the southern safety division.

»

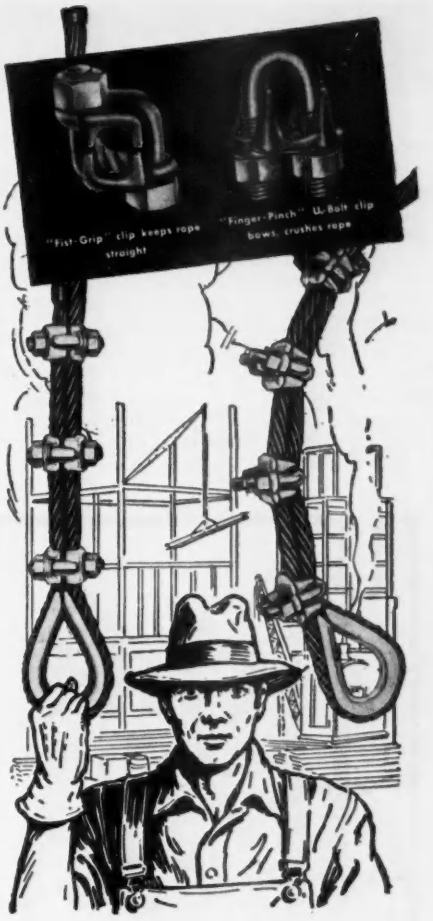
John C. Reid, associate chemist for The Atlantic Refining Company, has been named senior chemist at Philadelphia.

»

Richard Jodrey has joined The Ohio Oil Company as assistant geologist, Michigan division. He formerly was with Magnolia Petroleum Company at Lake Charles, La.

»

W. T. Cushing, Jr., who has been in the Plant Products Division of The National Supply Company at Houston, has been promoted to division engineer of the company's Northwest Division at Casper, Wyo. The Northwest Division also includes the company's stores and activities in Western Canada. **J. W. Chadwich,** whom Cushing succeeds, will continue in an advisory capacity and retire at the end of the year after 18 years of continuous service with the company.



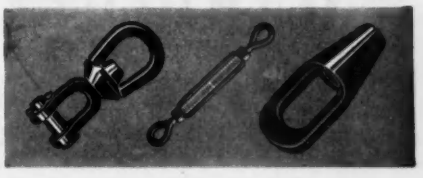
"I'LL TAKE MINE STRAIGHT"

A *straight* rope is a *stronger* rope . . . and for maximum strength, rope makers *insist* that kinking and crushing be eliminated. U-bolt clips *always* deform rope . . . particularly if they're "staggered". But LAUGHLIN "FIST-GRIP" CLIPS *insure* a straight rope because four flat bearing surfaces deliver uniform pressure over entire contact area . . . rope *stays* straight — no reverse bends under load.

"FIST-GRIPS" are foolproof . . . made in identical halves — can't be "staggered" . . . nuts on opposite sides for quick, easy wrenching . . . bolts and saddles drop-forged for strength and SAFETY. Look for LAUGHLIN'S "L" trade-mark at your supply house . . . write for catalog to Dept. 23, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Willard C. Gulick, with The B. F. Goodrich Company since 1926, has been named president of International B. F. Goodrich Company, it was announced by **John L. Collyer,** president of The B. F. Goodrich Company. Gulick, who has been general sales manager of the company's export division, succeeds **Stanley W. Caywood,** who retired July 1 for reasons of health.

»

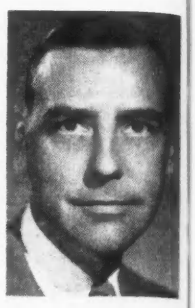
W. F. Earl has been chosen to succeed Burton C. Dunn as district geologist in Kansas and northwestern Oklahoma for The Ohio Oil Company.

Robert R. Boyle has been named division superintendent of Goodyear Tire & Rubber Company's tire plant in Buitenzorg, Java. Goodyear regained possession of its Java factory several months ago after losing it early in 1942 to the invading Japanese. The plant has been rehabilitated and is in production, but has not yet reached its prewar daily output.

»

James F. Gibbs of Wichita Falls, Texas, has succeeded S. V. White on the geological staff of Panhandle Refining Company. White has entered the consulting field.

Charles E. Nelson, Jr., has been named special assistant to President James E. DeLong of Waukesha Motor Company with the title of assistant to the president, a newly created post. Nelson entered the Waukesha organization in 1929 after several years as state wholesale representative for a major motor car manufacturer. He was secretary and treasurer of the Faegol Truck and Motor Coach Company of Oakland, Calif., which in 1933 became a subsidiary of Waukesha. In 1934 he became Waukesha factory production manager and since 1936 he has been director of purchases and production planning. His new duties will be in addition to past responsibilities.



Charles E. Nelson, Jr.

Deaths

C. N. Kirkpatrick, 57, chairman of the board of Landis Machine Company, Waynesboro, Penn., died at Waynesboro July 28 after an illness of several months. His entire working life of 34 years was spent with Landis. Beginning in the shipping department during his school vacations, he entered the sales department upon his graduation from Dickinson College in 1913 and successively rose to sales manager, secretary, general manager and vice president. Upon the death of **J. G. Benedict** in 1942 he was elected president. Due to ill health he was compelled to relinquish his active duties in March, 1947, he was elected chairman of the board. Kirkpatrick served from 1943 to 1946 as a director of the National Machine Tool Builders' Association and was a member of the National Metal Trades Association, National Industrial Conference Board, Army Ordnance Association, Pennsylvania Society of New York, and served on committees of WPB, NAM, and API.

C. N. Kirkpatrick

»

Harry W. Hobson, 64, who started with the Du Pont Company as a stenographer 44 years ago and rose to be assistant director of sales in the company's Explosives Department, died July 28. He had been ill about a month and was to have retired August 1.

»

F. R. Frye, 52, petroleum executive of the Geological Survey Division, Department of Conservation of the state of Michigan, died in Lansing, Mich, August 4.

Use Acme Cable Tools

Trustworthy Since 1900

Use Acme Combination Sockets and you SHARE our 47-years' of helping drillers recover, more quickly, stuck tools on difficult fishing jobs . . . Jobs which can be safely intrusted only to "Old Man Experience".

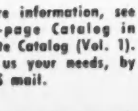
(1st) You SHARE the accumulated advantages resulting from the life-time experiences of Acme's own fishermen . . . Specialists ever in demand where drilling tools are "hopelessly" stuck . . . Specialists whose trustworthy "know-how" goes into every tool we make.

(2nd) You SHARE Acme's traditional policy: Exactness—enforced from billet to finished tool. . . . Steels that cost extra, because mills must meet rigid specifications: Analyses according to each tool's field service requirements . . . Forgings correctly heat-treated, by our automatically controlled processes . . . Craftsmanship to minutest detail — not to "stop-watch timing".

Thus Acme Combination Sockets assure that uniform, built-in character so necessary to hard jarring and tool recovery . . . Factors like: correct spacing, depth, angle and hardness of slip-wickers; also slips and slip-seat taper designed to engineered exactness—for maximum up-jarring, with minimum bursting stress.

In addition to featured Side Slot Combination Socket (Fig. 208) see other Acme Fishing Tools—in color panel—for your more safe, sure use.

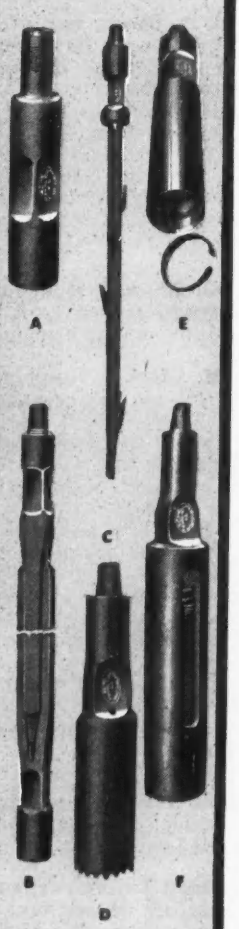
Fig. 208



Socket Slips

For more information, see our 24-page Catalog in Composite Catalog (Vol. 1). Or tell us your needs, by TODAY'S mail.

More of EVERYTHING You Need in an Acme String . . .



A—Babcock Rope Socket
B—Fishing Jar
C—Center Spear
D—Drill Mill
E—Ring Collar Socket
F—Full Circle Slip Socket

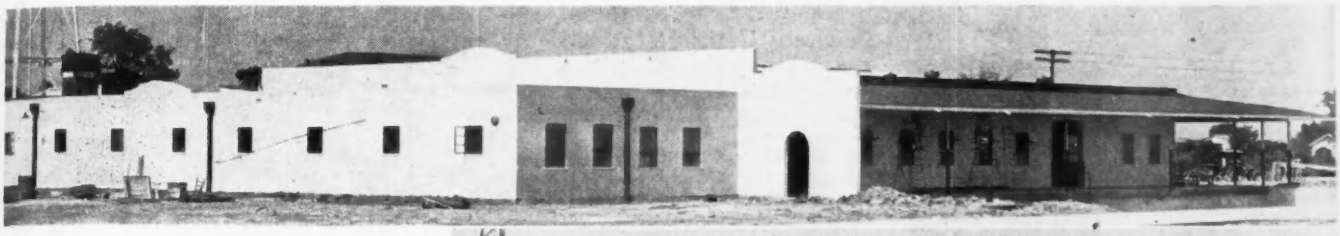
Acme Fishing Tool Co.

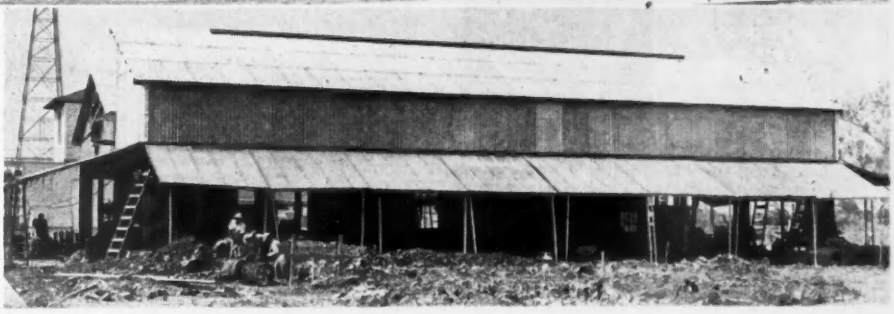
PARKERSBURG, W. VA.

Export Office: 19 Rector St., New York 6, N. Y.

ACME DRILLING & FISHING TOOLS Since 1900

Mission Manufacturing Completing Expansion Program





Above: Mission's new warehouse and loading dock.

Below: The new heat-treating plant.

The Mission Manufacturing Company, Houston, is completing an extensive expansion program which will allow the doubling of present output of principal products.

The expansion, according to President Dudley C. Sharp, involves a new plating plant for the manufacture of super-surfaced slush pump rods, doubling of present warehousing and shipping facilities, and addition of two large furnaces and a new cooling tower to the heat-treating department. Cost of the expansion is estimated at $235,000.

The plating plant will allow hard super-surfacing of slush-pump rods by new processes. Company officials state that expansion of plating facilities makes possible immediate doubling of present production levels of the rods, and increased services to Mission customers.

The operating level in the plating plant, which is also to be used for super-surfacing of certain parts of plug valves, is on the second floor. This allows the elimination of a basement, and the installation of efficient plating tanks on the first floor.

A modern generating room is completely closed off and ventilated constantly by specially filtered air.

New warehouse and loading dock areas will increase present floor space from 15,000 to approximately 30,000 square feet, and will provide for increased efficiency in handling of outgoing and incoming material.

Existing slush-pump rod production will be doubled by the addition of two furnaces and a cooling tower to the heat-treating department, according to officials.

Other officials of the Houston company, founded in 1932, are the chairman of the board, W. Bedford Sharp; executive vice president, W. T. Campbell; treasurer, Ed Prather; and secretary, A. M. Foute.

Failing Equipment Used to Learn Effects of Atom Bomb at Bikini

In an effort to determine the subsurface effects of the atomic bomb blasts on Bikini Atoll, a Failing 1500 Holemaster Drill was purchased by the government from the Geo. E. Failing Supply Company of Enid, Okla. Two Failing employes were flown to the island to assist in the research work. The two men are E. L. Alexander, chief engineer, and V. C. Mickle, drilling instructor. Mickle, will act as superintendent of drilling and Alexander will be the technical advisor.

Selection of the Failing equipment for the tests was made by Dr. Harry S. Ladd of the United States Geological Survey, who also is at Bikini for the tests. Dr. Ladd explained that several holes ranging from 200 to 300 feet in depth will be drilled at strategic points on the atoll and a complete set of cores taken for future study of the blast reaction. It also is planned to drill one hole to a depth of over 2000 feet.

Leyman Representative Named

Leyman Manufacturing Company, Cincinnati, has announced the appointment of Dean F. Gunby as the Houston District sales manager for McGowan pumps and Kodweld products. Stocks of pumps and spare parts will be warehoused in Houston. Gunby will also have complete charge of facilities for servicing petroleum and industrial requirements in the Southwest. The Leyman offices are in the Jameson Building, 1903 Blodgett Street, Houston.

DAN L. CLARK W. M. AVERILL RUPERT COX

DAN L. CLARK
DRILLING CO.

Drillers of

OIL AND GAS WELLS

●

POWER AND STEAM RIGS

NIXON BUILDING

CORPUS CHRISTI, TEXAS

Local 7746-7747 Long Distance 95

Herman B. Hendershot Organizes Supply Firm at Oklahoma City

Hendershot Tool Company has been organized by Herman B. Hendershot, Tulsa, with offices at 1006-12 Southeast Twenty-Ninth Street, Oklahoma City.

H. B. Hendershot

The organization has purchased all of the manufacturing facilities, trade name and other assets of the Mid-Co. Tool & Supply Company at Oklahoma City and will continue to manufacture Mid-Co.'s products, as well as other oil field tools and equipment.

Hendershot formerly was a director and secretary-treasurer of the Hinderliter Tool Company, which he assisted in organizing. He will be president and treasurer of the new company, and other officers include Clark C. Wright, formerly with Hinderliter, and Thomas H. Kelly.

Plant Expansion Is Planned by U. S. Steel Products Company

U. S. Steel Products Company has completed plans calling for a more than 32,000-square-foot enlargement to its plant near Dolton, Ill., Robert W. McClendon, district manager of this U. S. Steel subsidiary, announced.

Four new buildings are to be added to provide better office facilities; larger and improved locker rooms, rest rooms and first-aid facilities for plant employes. Also included is additional warehouse space for storage of sheet steel and other raw materials, and handling and mixing of paints.

International Harvester Contracts For Milwaukee Service Branch

Contract for construction of International Harvester Company's motor truck sales and service branch in Milwaukee has been awarded the Permanent Construction Company of Chicago, according to F. R. Howard, manager of the International Motor Truck sales branch at 145 South Second Street.

Construction of the new branch will begin immediately on a 7½-acre site acquired some time ago by Harvester, which is located at the southeast corner of East Florida and South First Streets.

Rubber Purchasing Manager for B. F. Goodrich is Appointed

Ralph D. Au has been appointed manager of the Rubber Purchasing Department of The B. F. Goodrich Company.

Au has been with the company since 1933 after receiving a Science Degree from Wooster College, Wooster, Ohio He spent several years in the chemical laboratories and Raw Materials Division in Akron before being sent to New York in 1938 to open the New York office of Crude Rubber Inspection. In 1942 he was loaned to the Rubber Reserve Company as assistant chief inspector of crude rubber. He again headed the B. F. Goodrich New York office of rubber inspection from 1943 until his appointment to the Purchasing Department on July 1, 1947.

Goodyear Official Named

Larry H. Coffin has returned to Akron as assistant to George K. Hinshaw, vice president and production manager of Goodyear Tire & Rubber Company's foreign operations. Coffin has been plant manager of the company's tire, textile and mechanical goods operations in Sao Paulo, Brazil, since 1942.

National Tube Makes 7½ Percent Price Hike on Pipe and Tubing

The National Tube Company, U. S. Steel subsidiary, has advanced pipe and tubing prices, effective August 1. Overall, the increase on steel pipe and tubing prices amounts to approximately 7½ percent.

These advances, which vary by item, average about $7.50 per net ton on oil country tubular goods, $7 on seamless standard and line pipe, $7.50 on buttweld pipe.

BOOK REVIEW

California Review

In its "Annual Review of California Crude Oil Production for the Year 1946" the Conservation Committee of California Oil Producers has reviewed the state's 17th year under its industry-managed plan of production efficiency control.

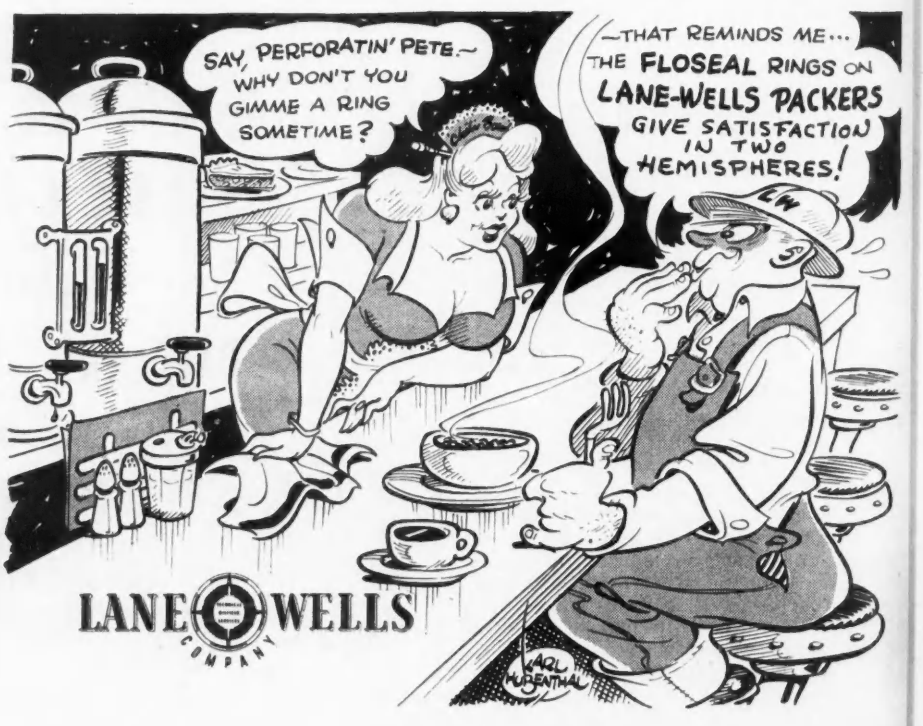
The report consists of more than 200 pages and is divided into two sections, historical and statistical. The historical section outlines the committee's organization and aims and reviews its 1946 activities. It compares the year's production with previous years and discusses the 1947 production prospects. A discussion of crude reserves and additions made by exploratory drilling is well presented and illustrated by tables and charts. Also included is a full report on 1946 crude supply, demand and inventories with prospects for the current year and presented with historical charts tracing trends back for 20 years.

The statistical section is devoted to significant statistics regarding the state's oil fields and pools. The year's production is summarized by fields and by major and principal minor company producers. The report goes further by breaking these yearly totals into monthly figures for the above listings. Also given are the number of producing and shutin wells by fields along with their actual and recommended daily production rates Tables showing field gas produced from and injected into formations complete the section.

The report was prepared and relieved by the Conservation Committee of California Oil Producers, 855 Subway Terminal Building, 417 South Hill Street, Los Angeles 13.

Refinery Directory

Containing over 5000 names is a new refinery directory. It covers home offices and operating personnel of refineries, cycling and natural gasoline plants in the U. S., Latin America and Canada. It also shows types of refineries, capacities, and products manufactured, etc. It is pocket-size and printed in easy-to-read type. Available from The Midwest Oil Register, P. O. Box 892, Tulsa. Priced: $10 per copy; $7 each additional copy.


SAY, PERFORATIN' PETE.— WHY DON'T YOU GIMME A RING SOMETIME?
—THAT REMINDS ME... THE FLOSEAL RINGS ON LANE-WELLS PACKERS GIVE SATISFACTION IN TWO HEMISPHERES!
LANE WELLS COMPANY
KARL HUBENTHAL

SQUEAKS from the BULL WHEEL

This Curious World

He always wondered where so many Smiths came from until he saw this sign: "Smith Manufacturing Company."

Her lips clung tenaciously to his—she had forgotten to remove her bubble gum.

Whoever named it necking was strongly ignorant of anatomy.

It must have been a skunk who first said (when the wind changed) "It all comes back to me now."

Have you heard about the fellow who took his girl out in the night and mist?

This Is a Sweet One

"What's that I smell, honey?"
"Sachet."
"Sachet? But that's something you put in drawers."
"Yeah. Uncomfortable, ain't it?"

Poet's Nook

Brown eyes gazed into mine;
Sensation.
Soft hands clasped in mine;
Expectation.
Red lips close to mine;
Temptation.
Footsteps in the hall;
Damnation!

No Bones About It

Two skeletons locked up in a closet were talking.
"What are we doing in this musty old hole, anyway?"
"Derned if I know. If we had any guts we'd get out of here."

The Better Life

"They must have a girls' baseball team in the harem."
"What makes you think so?"
"I just heard one of the girls ask the Sultan if she was in tomorrow's lineup."

More Important Talent

"Why do you go to dances with fellows like that? He can't dance."
"No, but boy how he can intermission!"

Hints for Householders

"Every time Johnny's wife has a baby, he buys a new accessory for the baby buggy. First it was a new top, then new bumpers, then some new fenders, then a pair of wind wings, and finally a set of new tires. Now they've got another baby and Johnny is stuck. He doesn't know what else to buy for the buggy."
"I think he ought to get a stop light."

Doctor's Orders

"Young lady, I'd like to give you a complete physical examination."
"But Dr. Jones examined me last week and said I was perfect."
"Yes, that's what he told me."

He Can't Miss

An oil operator's son who was always talking in terms of thousands of dollars was greeted one evening by his young son, who announced: "Well, Dad, I've sold our dog. Got $10,000 for him."
"I can't believe it! Let's see the money."
"Oh, I didn't get the money. I got two $5000 cats for him."

Nosey

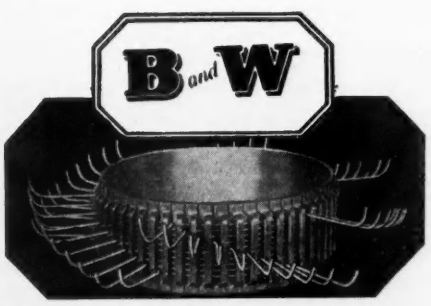
"I can't hear you, dear," his mother admonished as the lad whispered his prayers.
"I wasn't talking to you," he answered firmly.

Another Tall One

St. Peter was taking a new arrival on a tour of heaven.
"What," asked the stranger, "is the building with all the bars on the windows?"
"That's the jail. We keep the Texans there. The durn fools all want to go back home."

Bad Habit

"Boss, may I have next Wednesday off?"
"I don't think so."
"But it's my silver wedding anniversary and my wife and I had hoped to celebrate."
"For heaven's sake! Am I going to have to put up with this every 25 years?"



(Patented and Patents Pending)

B & W Wall Cleaning Guides help to give you a good cement job the first time

DON'T SQUEEZE!
It Costs $ $ $ $

BRUCE BARKIS — B and W INCORPORATED — KENNETH WRIGHT
Well Completion Specialists
HOUSTON, TEXAS • LONG BEACH, CALIF.

"Best Bet Yet"

DEEP WELL SWABS

Field production men set the specifications for this new Swab. It does the job they asked for. Large fluid clearances for quick, free dropping. Pulls light or heavy loads from great depths. No fluid loss, complete load each trip. Sensitive rubbers automatically adjust to right wall pressure for weight of load. Rubbers firmly supported yet easily preset to irregular tubing I.D.'s and to compensate for wear. Simple design. Easy to operate on rig floor. Standard cage, ball and seat, replaceable anywhere. Quickly tandemed. Actually cuts swabbing costs and time.

- Large fluid passage.
- Standard reversible ball and seat.
- Rubber quickly changed on job.
- Break here to install rubber.
- Rubber easily adjusted—0.42" under tubing I. D.
- To expand rubber make up on cup.
- Two reinforced PBX Special Rubbers used.
- API threads. Lead compounded for easy break.
- Alloy steel throughout. Heat treated to maximum tensile strength. Rust proofed per Navy specifications.
- Break here to tandem swab.
- Large internal area, streamlined, reduces tendency to blow out of hole.

Write for Catalog No. 340

Specify PATTERSON-BALLAGH
A DIVISION OF BYRON JACKSON CO. *"Best Bet Yet"*

DEEP WELL SWABS

1900 E. 65th Street, Los Angeles 1
6247 Navigation Boulevard, Houston 11
808 Graybar Building, New York 17
931 Russ Bldg., San Francisco 4

WORKING MODELS

For

PATENTS

CONSULT

THE RICHARDS COMPANY
Spicewood Springs Road
AUSTIN, TEXAS

DIESEL JACKET WATER STABILIZATION

Maintain effective cooling . . . eliminate scale formation . . . prevent pitting and corrosion by stabilizing your Diesel Jacket Water. We offer reliable stabilization by intelligent application of standard methods. Phone, write, wire for further information.

25 Years Successful Experience

GULF ENGINEERING CO., INC.
"Service, Not Promises"
1682 INGEBORG ST. HOUSTON, TEXAS
916 S. PETERS STREET NEW ORLEANS, LA.

UNANIMOUS!

PARRITE

THE BEST COLD WATER STARCH
PARR PRODUCTS, INC.
920 Calliope St. New Orleans 13, La.

W. P. JENNY
Consulting Geologist and Geophysicist
MICROMAGNETIC SURVEYS
AERIAL MAGNETIC INTERPRETATIONS
GEOPHYSICAL CORRELATIONS
Charter 4-4777 Lehigh 0940
1404 Esperson Bldg. HOUSTON, TEXAS

THE FORT WORTH LABORATORIES

Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas.

Sun Completes Plant

Completion of a $200,000 pressure-maintenance plant to conserve crude oil in the Norwich field, Missaukee County, Michigan, was announced by James E. Pew, manager of the natural gas and natural gasoline division of Sun Oil Company. The plant was constructed as part of a $4 million oil and gas conservation program begun in 1946. Nine processing plants are contemplated under the program.

Advertisers' Index

* The asterisk indicates that detailed information on products and services of the firm will be found in current 15th (1946-47) edition of The Composite Catalog of Oil Field and Pipe Line Equipment.

EDITORIAL INDEX PAGE 21

*Acme Fishing Tool Co. ---- 76
American Cyanamid Co. ---- 8
*American Iron & Machine Works, Co. ---- 68
American Manufacturing Co. of Texas ---- 45
*American Meter Co. ---- 74
*B & W, Inc. ---- 79
*Baker Oil Tools, Inc. ---- 24 and 55
*Baldwin-Duckworth Division Chain Belt Co. ---- 12
Wm. M. Barret, Inc. ---- 80
*Black, Sivalls & Bryson, Inc. ---- Insert opp. 8
The Bovaird Supply Co. ---- 3
Briggs & Stratton Corp. ---- 65
*Byron Jackson Co. ---- 15
*Cameron Iron Works, Inc. ---- Insert Opp. 9
*Chain Belt Co. ---- 12
Dan L. Clark Drilling Co. ---- 77
Climax Molybdenum Co. ---- 51
*The Colorado Fuel and Iron Corp. ---- 9
The Continental Supply Co. ---- 19
*Crane Co. ---- 26
Crowell & Steele, Inc. ---- 80
*Diamond Chain Co., Inc. ---- 14
Dowell Incorporated ---- 20
*Durbin-Durco ---- 80
The Eagle-Picher Co. ---- 66
*E. H. Edwards Co. ---- 6
Ft. Worth Clearing House Association ---- 69
Ft. Worth Laboratories ---- 80
*The Garlock Packing Co. ---- 67
General Motors Corp. ---- 5
George Engine Co. ---- 70
*Gray Tool Co. ---- 63
Gulf Engineering Co. ---- 80
Houston Laboratories ---- 80
*Hughes Tool Co. ---- I Cover
Hyatt Bearings Division General Motors Corp. ---- 5
Industrial Chemicals Division American Cyanamid Co. ---- 8
*International Harvester Co. ---- 16
International Petroleum Exposition ---- 7
W. P. Jenny ---- 80
*Jensen Brothers Manufacturing Co. ---- 62
Jones & Laughlin Steel Corp. ---- 22
Jones & Laughlin Supply Co. ---- 52
*Lane-Wells Company ---- 78
*The Thomas Laughlin Co. ---- 75
*Line Scale Co. ---- 55
*Link-Belt Co. ---- 1
Lone Star Cement Corp. ---- II Cover
*Martin-Decker Corp. ---- 2
*McEvoy Co. ---- 57
*Mission Manufacturing Co. ---- Insert 40-41
National Bank of Tulsa ---- 18
*The National Supply Co. ---- 10-11
New Bedford Cordage Co. ---- 67
*The Parkersburg Rig & Reel Co. ---- 17
Parr Products, Inc. ---- 80
*Patterson-Ballagh Division Byron Jackson Co. ---- 48 and 79
Pelican Well Tool & Supply Co. ---- 64
*Penberthy Injector Co. ---- 54
Pioneer Air Lines ---- 67
The Richards Co. ---- 80
Santa Fe Railway ---- 71
*Security Engineering Co. ---- 13
*Standco Brake Lining Co. ---- 80
*Sterling Machinery Corp. ---- 56
Telephone Repair & Supply Co. ---- 80
*Templeton, Kenly & Co. ---- 56
*The Thermoid Co. ---- 4
*Unit Rig & Equipment Co. ---- III Cover
*Weatherford Spring Co. ---- 61
*Wickwire Spencer Steel Division The Colorado Fuel & Iron Corp. ---- 9
Wyatt Metal & Boiler Works ---- IV Cover
The Youngstown Sheet & Tube Co. ---- 47

William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique
GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

LAND WATER
SEISMOGRAPH SURVEYS
CROWELL & STEELE, Inc.
MODERN 24-CHANNEL EQUIPMENT
OFFICE AND LABORATORY 3812 WEST ALABAMA PHONE HADLEY 2033
MAILING ADDRESS 3416 ELLA LEE LANE PHONE J 2-3986
HOUSTON 6, TEXAS

LOAD BINDERS
Drop-Forged • Malleable Iron • Steel

Drop-Forged • Heat Treated • 2 Sizes
Durbin-Boomer F-1—2 swivels, ⅜, ⅞ or ½" chain
Durbin-Boomer F-2—2 swivels, ½, ½ or ⅝" chain
Malleable Iron • Heat Treated • 5 Sizes
MIDGET No. 1—1 swivel, ¼" chain
DELTA No. 1—1 swivel, ⅜ or ⅝" chain
DIXIE No. 1—2 swivels, ⅞ or ½" chain
LONE STAR 1—2 swivels, ⅞, ½ or ⅝" chain
LONE STAR 2—2 swivels, ⅞, ½ or ⅝" chain
Write for Catalog
DURBIN-DURCO
6611 Olive Street Road • St. Louis 5, Mo.

Standco NO-SMOKE
STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off evenly while drilling." It never scores brake rims. See pages 3608-3613, Composite Catalog.
Standco Brake Lining Co.
HOUSTON

MAGNETO TELEPHONES
for construction jobs, mines, oil wells, country homes, estates, etc. Permanent or temporary installations. Also wire, insulators, ground rods, batteries, and other necessary equipment. Prompt delivery. TELEPHONE REPAIR AND SUPPLY COMPANY, 1760 Lunt Ave., Dept. 136, Chicago 26, Ill.

HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267 Box 132, Houston, Tex.